The BRIGHT IDEAS Co (UK) Ltd

Hainge Road, Tividale, West Midlands, B69 2ND, England (UK)

Diamond Blades & Cores

Welcome to the Bright Ideas Data Sheet for Diamond Blades and their Cores. The information you will find in here will focus primarily on detailing the beneifts of using different types of diamond blade and which blades benefit you the most for the best cut.

Introduction:

Diamond Blades are designed to cut through various varieties of material including ceramic, porcelain, granite, stone, concrete, glass and metals etc. The blade consists of cutting segments which are attached to the circumference of the cutting disc, which is known as the core. Working at high speeds the core can become highly abrasive. Diamond tools on the other hand grind the material, such as an Angle Grinder although the word "cut" is still the word associated with the process of grinding.

The segments carry diamond crystals which are held in a metal alloy. This alloy has can be identified by one of two names; the bond or the matrix. From these diamond crystals and bonding matrix a specifically engineered segment is created called a continuous rim which is done by specially shaping and heating the diamond crystals and the bonding matrix. Continuous rims are much wider than the blade core as when cutting takes place, it allows dust to quickly pass to the side of the blade and prevents binding.

The Diamonds:

In general cases the diamonds used for the cutting discs are grown synthetically allowing them to be moulded to a certain shape depending on what type of material the blade is designed to cut. With some cases both synthetic and real dimaonds are used. The difference between real and synthetic diamonds is synthetic diamonds have the exact same degree of hardness as the natural diamonds, but unlike natural diamonds they can vary in structure. However, synthetic diamonds can be designed to grow to an optimum structure which will remain consistent and also be modified to fit a particular grain size or crystalline shape. This helps to optimize the life span of the blade and also increase the accuracy of the blade's design for cutting through materials such as porcelain and stone etc. It is important to note that life span of the blade is not solely dependant on how many diamonds that are present, but more of finding a balance between the concentration of diamonds and the bond composition which relates to the type of material the blade is designed for cutting i.e) ceramic, stone, concrete, granite etc.

There are three different methods that join the segments together with the core;

- SINTERING:
This method fuses together the bond metals by using heat and a high pressure onto the core. Blades manufactured this way tend to be cheaper.

- LASER WELDING:
The method of laser welding is mainly used for creating high quality blades where the join made is permanent. Any type of loss of segments will most likely be an error on the users side.

- SOLDERING:
Wet cutting discs tend to use this type of method if they use a larger diameter. This method involves brazing the segments to the core using silver solder. As the wet blade is designed for use with water and will be cool during the process of cutting the segments are not required to be joined at a high temperature.

Contact Information:
Tel: 0121 520 9200
Email: sales@thebrightideas.co.uk

The BRIGHT IDEAS Co (UK) Ltd

Hainge Road, Tividale, West Midlands, B69 2ND, England (UK)

Diamond Blades & Cores

The Bond:

When cutting materials a rank ranging between hard and dense to soft and abrasive is used. A material such as glass which is classed in the hard category range, the diamond grain will wear down and or alternatively break. Because of this it is necessary for the bond to be soft allowing both it and the diamond grain to wear away over time. Soft materials such as asphalt will not affect the diamond grain as much and will remain in good condition. However, the bond will still need to be hard so it can withstand wear from abrasive larger particles which can be found in materials such as asphalt. An example of using a blade designed for cutting through material such as granite and used on asphalt would result in the suffering of rapid bond wear and the consquential loss of un-worn diamonds. If an asphalt blade is used to try and cut through granite, the end result would be rapid diamond loss on the surface of the segment, but the bond would remain intact resulting in no type of cutting action. The perfect wear is when diamond grain is released evenly over time, exposing new diamond and also where the bond trails behind each diamond like a comet tail for optimum cutting.

The Core:

The core is made from a heat treated high alloy steel which is then balanced to withstand stress of rotating up to 7,950m/sec (for a 300mm blade) without warping. Various core designs exist to optimise cutting creating both consistent and perfect cuts. Where the finished appearance of the cut is an important factor especially on porcelain tiles or granite worktops, the segments will be designed as a continuous rim without spaces. These are known as gullets. These type of blades can be run dry up to certain depths although water will always extend the lifespan. It is recommended when cutting past these depths to use water. Countersunk channels are also used to evenly disperse dust on the sides of the blade and can lie on either right or oblique angles in position to the centre of the core. This type of blade is commongly known as a turbo blade. Contoured profiles can also be implemented into continuous rim blades in the shape of radius, bevel or ogee which will easily cut through granite and marble worktops.

Segmented Blade:

All other blades will have an infinte number of variations determining the relationship between the segment length and height to gullet width and depth with the factor of whether or not the gullet ends with either a circle or a curve. The deciding factor however is the type of material the blade is designed to cut. Blades designed for cutting through asphalt will aim to remove the asphalt in large particles, at speed and without clogging so a wide gullet is necessary. With asphalt or green concrete being abrasive materials, the appropriate design for the blade is to have a few segments having a "drop" at one end. This effective design minimises the wear on the core and prevents any undercutting of the segment. Other types of blades feature gullets set at 30 degree angles fitted with turbo segments and will sometimes have perforated patterns through the core helping to reduce noise, keep the blade cool and create a see-through effect when running at speed. Due to technological advances many types of blades are now designed to cut through more than just one material.

Conclusion:

Diamond blades featuring higher qualities such as turbo blades will evidently cost more but at the same time will last longer and offer you cleaner and finer cuts than lower tier blades. The important factor overall however is to choose a blade, regardless of whether its high quality or budget range that fits the job application as a porcelain diamond blade is going to be useless against cutting concrete.

Contact Information:
Tel: 0121 520 9200
Email: sales@thebrightideas.co.uk