

The Truth About Holes

Concrete Drilling

There have been plenty of requests to discuss concrete drilling from the readers, so we decided to expand on the story "Concrete Drilling, Get a Rotary Hammer" in the 6th Edition of the MaktimesSA and place emphasis on the right tool and the right technique to make holes in concrete efficiently.

Making holes in concrete doesn't have to be hard work. But many contractors make it difficult by trying to make do with the tools they have. When you look at the time lost to using the wrong tool, the cost could easily pay for the new tool or bits needed to speed the process.

That's the consensus of power tool manufacturers who deal with contractors' hole-making questions. Here's how they suggest you get to the hole truth.

Do you have the right tool?

We often see contractors trying to use a hammer drill to do a job that should be done by a rotary hammer.

We see contractors burning out hammer drills and bits all of the time because they are using the wrong tool for the job. When it comes to poured concrete, your best bet is a rotary hammer. A hammer drill is too light of a tool for making any holes in poured concrete.

Hammer drills have a difficult time making holes in concrete because the hammer drill relies on high rotational speed and a lighter impact to chip away material. A rotary hammer uses pounding force to fracture the concrete. The rotation of the bit changes the orientation of the edges of the bit's carbide tips in the hole and augers dust out of the hole.

Size up

While it's tempting to use a smaller tool for a slightly bigger concrete hole making job, the tool experts recommend against it. Instead, select your tool so the job falls within the operating capacity of the tool, around 70% of the tool's maximum operating range is a good level to work at, leaving a 30% safety range. If the concrete has a high compressive strength, is older concrete, or has very hard aggregate, consider using a larger tool to make the hole.

Concrete bits

Different bits and the applications they are used for, was discussed in the 13th Edition of the MaktimesSA. Here we discuss in more detail the bits used for drilling holes in concrete. Concrete bits do not drill the way a wood bit goes through wood or a jobber bit drills steel. Instead, it works by pulverizing the concrete to dust, then evacuates the dust away from the tip and out of the hole. Drilling in concrete is, in reality, a continuous sequence of actions to pulverize the concrete and to remove the dust.

SDS stands for Schnell Drilling System or Slotted Drive System. SDS shanks are slotted and have curved recesses all of which lock nicely into the tool holders of the rotary hammers. Most modern rotary hammers below 30mm capacity would utilize the **SDS-PLUS** drill bit system and is by far the most popular worldwide. **SDS-MAX** is the "super colossal" version of SDS-Plus. They range from 12mm to 50mm solid bits. **SPLINE SHANK** are bits that are becoming less popular due to International Standardization. They are basically drill bits that have fins (or "splines") at the end of the shank.

Carbide tips are sintered micro-grain carbide and cobalt, moulded into a precise tip size and shape. This combination is brazed to the flute, resulting in a very hard, durable tip.

You can find bits in all price ranges. A good rule of thumb: You should be able to get about 100 holes per bit unless you are operating in very demanding conditions or damaging the bit by not drilling straight down into the hole. The most economical drill bits will have two tips and are the most commonly used.



The new Makita Deltagon SDS+ drill bits have three cutting edges rather than the traditional two and this simple formula delivers far more accurate holes, even in the toughest materials. A traditional two-edge drill bit suffers from poor directional stability, especially where the drilling of a pilot hole is not possible or practical. The drill bit tends to “wander” making the finished hole oversize and often actually triangular rather than round.

The Makita Deltagon three-edge drill bits have a more stable tri-axial cutting performance, the three edges keeping the bit firmly in one position. The result is a hole exactly where positioned and a far better quality of “round” hole, especially important when using adhesive or tension fixings.

Makita Deltagon drill bits have solid tungsten tips, the tungsten brazed onto the carbon steel bit which is then finished by rotary grinder to total accuracy. This formula gives a very long working life, easily justifying the cost investment. Deltagon bits should be the preferred selection for any drilling into brick, block, concrete, reinforced concrete, mortar or stone. A Deltagon bit will drill through steel cladding up to 1mm thick and then into the concrete section all in one process.

The re-enforcing bars in concrete castings can cause serious accuracy problems as well as the risk of the two-edge drill bit snagging with risk to the machine and the operator. Here again the three-edge Deltagon bit proves valuable. The three cutting edges will keep the bit rotating whereas a two-edge bit will either snag beside the rebar or be forced away from the rebar elongating the hole. The three-edge bit will always deliver a round hole, safely.



Maintain your tools

Care for the tools you are using has been mentioned in previous editions, but the importance of this cannot be stressed enough. Next to using an undersized drill for a drilling job, poor maintenance practices are a leading killer of rotary hammers.

Rotary hammers create impact through electro-mechanical or electro-pneumatic systems inside the tool. These systems transfer intense forces into concrete in a highly abrasive environment. The components that create this energy must be maintained.

It's important to pay attention to the maintenance intervals on these tools. Too many people run them to failure when timely lubrication and cleaning would have greatly extended the life of the tool.