Being fairly new to the locksmith industry fresh off an apprenticeship, learning the trade and trying to keep up with the new technology as it becomes available, it has become apparent to me that this field, like many others, can be confusing to navigate to find the best product for the job. This is true for both tools aimed at the locksmith industry and the security products sold. (Editor’s note: This article was originally written in 2012.)

All That Glitters
It is very difficult to cut through all the flashy advertising of products and get down to what really works. So many products are designed for impulse buying. For the average person, it takes quite a bit of knowledge and research on a product to get something that meets your needs and that does what you expect it to do – from padlocks to deadbolts to safes. Usually, the worst products are marketed with the most glitter and glam and have the “grab me now” packaging.

I quickly found out that the same thing is true for drill bits and construction tools in general. So I realized if I want to stock the van with quality tools and quality equipment, I’ll need to do some background research on almost everything I purchase. This will make my job easier and allow me to service the customer to the best of my ability, saving time and energy, and saving the customer some money.

Wayne Winton pushes past flashy packaging to get to the brass (steel, cobalt or carbide) tacks of drill bits.

Bits and Pieces
I’ve found that one of the most difficult things to get legitimate research and reviews on is drill bits. As it turns out, I got my first call to drill a Cannon safe with three layers of ⅛” hard anti-drill plate and an electronic lock that had gone bad upon delivery. All common nondestructive options were exhausted. The only way to open it was by drilling.

This would be my first safe drill encountering hard anti-drill plate. After talking with several different industry professionals and the person under whom I had my original apprenticeship, I decided I would take the job and learn on the fly. I was armed with a basic idea of what to expect and a game plan, even though horror stories of
relockers, glass plate and ball bearing hardplate floated in my head.

I knew the key to making this safe drill profitable and easy to repair would be quality drill bits and quality drill rig, along with pinpoint accuracy for drill points and a knowledge of what was inside the safe mechanically. I had a few days before this job, so I decided to begin my research on drill bits. This took countless hours of reading everything from paid advertisements to private forums and blogs from welders, fabricators and machinists.

I attempted to sort through everything from materials like titanium nitrate coating, high-speed steel (HSS), cobalt, black oxide and carbide, and then options like 118° or 135° drill point angles, pilot points, split points, and on and on the list goes. I knew I would need help from a professional, so I was off to the local welding supply store to pick their brains, since they deal with metal and steel every day. They had very good advice for most applications, however they were unfamiliar with the term hardplate or anti-drill plate. The closest thing I could come up with to describe hardplate was a very hard alloy stainless steel, like that used to make knives, with a Rockwell Scale “C” rating of 60+. They directed me to their best set of drill bits in stock, which was the Champion Brute Force Platinum series. They also stated that these drill bits may not drill something that hard and I may need to use a carbide-tipped drill bit.

**Putting Them to the Test**

Trying to put all of this information together is very difficult. I began to understand that it would be hard to get a straight answer and there would be no possible way to know if a drill bit was going to penetrate this hardplate unless I tried it out for myself. That's when the light clicked: I needed to try these drill bits out on a piece of this hard anti-drill plate before I go do this in the field with the customer. That would be the only way I could be 100 percent positive that I would be able to accomplish the job in a reasonable amount of time at the location.

I had a piece of hardplate ¼” thick out of a Winchester safe with an HRC rating of 60+ for my practice run. I also wanted to find out what drill bits really did work on what materials not just one specific type so I began to collect tool steel, chisel steel, knife steel, spring steel and other hardened alloys that would not be commonly seen or that had not been discussed on Internet forums.

I wanted to break this down scientifically to have a 100 percent definitive way to decide what drill bit will work on what material and why. I already had some drill bits from common big-box stores along with the Champion Brute Force Platinum series from the local welding supply store. The specialty brands, like twist diamond drill bits, locksmith drill bits, and solid carbide drill bits, I ordered online. I planned to compare them head-to-head on different materials from some of the hardest steels and alloys that I could possibly come up with.

The plan was to research the Rockwell Scale C rating (HRC) of the steel that was being drilled and the HRC rating of the drill bit being used. This would give me a flawless formula for drilling hardened alloys and other uncommon materials that could be encountered. If the drill bit is a certain percentage harder than the material being drilled and has a sharp cutting edge, the drill bit will cut. I just needed to find the formula of how much harder it needed to be for the specific applications.

“It is very difficult to cut through all the flashy advertising of products and get down to what really works. So many products are designed for impulse buying. .... Usually, the worst products are marketed with the most glitter and glam and have the ‘grab me now’ packaging.”

The results from this experiment are listed below, and as far as the Cannon safe goes: All drill bits tested in this experiment were purchased outright and no company goes: All drill bits tested in this experiment were purchased outright and no company paid for any of the actions described here.

The actual video results of this test can be found at www.wayneslockshop.com and at https://www.youtube.com/watch?v=_Mr0sU4SVW8. I can only hope this article helps save other fellow locksmiths and safe technicians the time, frustration and aggravation of finding quality drill bits.
DRILL BIT EXPERIMENT RESULTS

The steels in the experiment included 440C hardened stainless knife steel 58-60 HRC, leaf spring steel 50-62HRC, mild steel 20-36HRC, D2 tool steel 54-58, safe hardplate or anti-drill plate 60+, Grade 8 Bolt 33-39, chisel steel 58-62.

HRC – Rockwell Scale “C”

Hi-Molybdenum HSS Drill Bit
- Works up to 54ish HRC
- Can drill: Mild steel, some tool steel, some spring steel
- Cannot drill: hardplate, anti-drill plate, stainless steel, spring steel
- Pros: These bits are good in hand drills and most drilling applications. They will be the most flexible and forgiving when not used in a drill press. Common HSS drill bits come in a large variety of sizes and lengths, making them useful in a wide range of applications.
- Cons: These bits have limitations in hardened and alloy steels.
- My personal choice: Champion Brute Force Platinum Series Hi-Molybdenum and Norsemen Magnum Super Premium Hi-Molybdenum drill bits

Cobalt HSS Drill Bit
- Works up to 58ish HRC
- Can drill: Mild steel, some spring steel, some tool steel, some stainless steel
- Cannot drill: hardplate, anti-drill plate, hardened stainless steel
- Pros: These bits are good for most drilling applications. Cobalt maintains a cutting edge longer than common HSS drill bits.
- Cons: Cobalt has limits with hardened steel and is more fragile and can be broken more easily when used with a hand drill.
- My personal choice: TTP-Hard Drills. They are a UK-based business, but the bits are available in the United States in standard imperial sizes. It is the only company to my knowledge that has had bits tested and claims a rating of 66 HRC. Bosch has a quality cobalt drill bit product in US standard size.

Carbide-Tipped Drill Bit: Locksmith and or Masonry
- Works up to 70+ HRC
- Can drill: Almost any steel, hardened alloys, cast iron, hardened stainless steel, spring steel, tool steel, ceramics, brick, concrete
- Pros: These bits drill all steel when enough pressure is applied. They maintain integrity under extreme heat and pressure. They are reasonably priced and commonly found. Carbide-tipped drill bits come in a large variety of sizes and lengths making them useful in a wide range of applications.
- Cons: The blunt tip requires extreme pressure to produce cuttings in steel. The blunt edge tends to “walk” and is hard to get started on all steels. Because of the pressure required, it would be difficult to use in a hand drill when using larger size bits. The small carbide tip is susceptible to cracking and chipping.
- My personal choice: For quality, I have found no better choice than the StrongArm Safe Cracker Bits. They have always proven to be reliable and quality drill bits. The Bosch masonry carbide-tipped bit is a good substitute in a pinch. It is also easy to find at almost any common hardware store location.
**Solid Carbide Drill Bit**
- Cuts all steels 70+ HRC
- **Can drill**: All steels mild hardened and stainless, along with most ceramics. This drill bit is so hard and sharp it can even drill a machine style hole right through all of the HSS, Hi-Molybdenum and cobalt drill bits mentioned in this article! I have done it.
- **Cannot drill**: Carbide Matrix GSA container hardplate, as this fragile edge will be destroyed
- **Pros**: The sharpened cutting edges and 40° split point won’t “walk” on the drilling surface like the carbide-tipped bit, and will even start drilling on a round surface such as a ball bearing. These drill bits can be used in a handheld drill because less pressure is required to make them cut into the material, however, using these brittle drill bits in a handheld drill can cause them to break very easily. Special caution, knowledge and lubrication must be taken when using these drill bits and a handheld drill, especially with small drill bit sizes. These bits can be sharpened much more often and have a working longer life than a carbide-tipped drill bit.
- **Cons**: The sharp tip and fine edges can chip easily and ruin this drill bit; it can break very easily. There are limited options, such as diameters and lengths. These are expensive and available only from industrial companies online; you most likely will not find them at your local hardware store.
- **My personal choice**: The TERMINATOR HI-Rock straight fluted solid carbide drill bit set is the best solid carbide drill bit I have seen so far. Advantages of this drill bit include the straight shooting system, along with a 40° split point angle, which allow for easy starting and quick material removal. The straight fluted design reduces the “grab and pull through” effect of a conventional “twist style” drill bit. This proves extremely useful when drilling a mechanical dial combination lock casing.

**Diamond-Coated Twist Drill Bit**
- Will drill up to the 50ish HRC
- **Can drill**: Mild steel, some tool steel, some spring steel
- **Cannot drill**: hardplate, anti-drill plate, hardened stainless steel
- **Pro**: These bits are able to drill some steels
- **Cons**: Cutting stops quickly after the diamond grit has worn off the small contact patch; the bit then behaves like common HSS bit (NOTE: This review of diamond-coated twist drill bits does not reflect diamond-core drill bits, as drop diamond-core drill bits have proven to be much more successful and reliable in drilling hard surfaces. This is due to the fact that they remove less material and provide a larger area for the diamond aggregate to cut into the material. I hope to compare core drill bits in a similar experiment in the near future.)
- **My personal choice**: None. My experience with this type of drill bit has shown that the diamond wears off much too fast on the small contact area to record a result.

**Diamond-Core Drill Bit**
- Cuts or grinds carbide and hardened steels 70+ HRC
- **Can drill**: Cast iron, Carbide Matrix GSA container hardplate
- **Cannot drill**: mild steel, spring steel, stainless steel, hardened stainless steel
- **Pro**: These bits can provide a grinding effect when carbide simply stops drilling to get through a “hard spot”.
- **Con**: These bits will gum up and create heat in some softer steels, becoming useless.
- **My personal choice**: StrongArm diamond-core bits. This is a specialty drill bit that you will not find in hardware stores.

Wayne Winton is the owner of Tri County Locksmith Service in Glenwood Springs, CO. He specializes in safe and vault work along with commercial door and panic hardware. He’s dedicated to learning every day and putting his skills to the test, along with sharing information with other industry professionals through vetted video education at wayneslockshop.com. Check it out to see him in action.