Choosing a Drill

An powered drill is probably be the most common tool owned and used by the do-it-yourself person and is usually the first electric tool purchased. You can spend from $30 - $400 for a tool that meets your needs. Modern drills have a variety of features which can be confusing to anyone looking to buy one. The main features are: Corded or cordless; Power; Speed; Chuck size and type; Hammer function; Handles; Depth stop; Screwdriver function - torque control and reverse function;

Corded or cordless
Corded electric drills have a cord (with plug) attached which needs to be plugged into an electrical supply. This does limit the distance you can work from an electric socket (although a suitable extension can be used). On the other hand, it's just a case of plug it in and start drilling. Corded drills tend to be more powerful and have higher speeds than cordless electric drills. Except for the smallest ones, they do tend to be too bulky to use as simple screw drivers.

Cordless electric drills have made great advances in recent years and can have similar performance to most corded drills. Their great advantage is that they can be used almost anywhere until the battery pack is exhausted. Even then, most models have replaceable battery packs and having a spare, fully charged, battery pack will enable the electric drill to come back to life.

Power
Cordless drills are measured in volts. Drills are available in everything from around 2 volts (for a cordless screwdriver) to the newest 24-volt tools. Higher voltage means heavier weight, so consider buying a tool that will meet 80-90% of your needs. Twelve to 14.4 volt models are the most popular, and they will usually meet most homeowner's work needs.

It is a distinct advantage to have at least one replaceable battery pack. With an extra battery, you don't have to stop working when the battery gets low - just switch batteries and charge the one not being used. Different types of battery are used on different models, the two common types being: Nickel Metal Hydride (Ni-Mh) and Nickel Cadmium(Ni-Cd).

Corded drills are measured in amps. Generally, a higher amperage motor means more power.

Either way, you should choose a drill with more power than you think you need. A low powered drill that is used hard, will be working at maximum power all the time. This means that you will be working its motor, bearings etc. nearer their limits - while a higher wattage tool will work less to do the same job, with a consequent reduction in wear and tear. In simple terms, the more you intend to use a drill, the higher the rated power should be.

Speed
The ideal speed of a drill bit depends upon the size of the bit and the material being drilled. Larger bits need to turn slower than smaller bits otherwise they may overheat and lose their cutting edge. They can also put a lot of strain on the motor as it usually runs fast to compensate for its lack of power.

Single speed drills (2000/2500rpm) are available but lack versatility.

One step up from single speed drills are those offering fixed speeds, generally two, which are selected by the operator, the slower speed being about 500rpm less than the fast speed. The switch between speeds may be electronically or mechanically (by changing the gearbox ratio).

One step up again offers variable speed control where the speed is infinitely variable up to a pre-set limit. The speed is usually controlled by a trigger, the further it is pulled back, the faster the speed of the drill. Some electric drills have an adjustable trigger stop which can be set so that the drill is limited to a speed suitable for the job in hand. Without this pre-set stop, it is very easy to unconsciously over drive the drill while concentrating on drilling

Most variable drills provide a high torque, slow-start; this enables a hole to be started carefully with reduced risk of the bit slipping and damaging the workpiece. Long periods of use at low speeds should be interspersed by bursts of high-speed running in order to keep the motor cool.

A slow-speed also allows the use of a screwdriver bit in the chuck to drive screws.

Some variable speeds drills have two (or more) speeds ranges (such as 0 to 1100 and 0 to 3000 rpm). A separate switch on the body of the drill switches between ranges.

Generally corded drills offer higher maximum drilling speeds than cordless ones. The overall speed will also be more consistent since there is no speed reduction due to loss of power in the battery.

Chuck size and type
The chuck is the attachment where the bit is inserted, having jaws that grip the bit. Drills come in 1/4", 3/8", and 1/2" sizes.

This measurement is the chuck size and indicates the shaft diameter of the bits and accessories that will fit the drill. (For most homeowners, a 3/8" size should be sufficient).

Chucks can be keyed (the jaws are tightened or loosened with a key) or keyless (the chuck can be tightened or loosened by hand). Keyless chucks offer two major benefits. If you have ever misplaced or lost a chuck key, you already know one of them. A keyless chuck will also allow bits to be changed more quickly. A real plus when you need to change from a drill bit to a screwdriver bit repeatedly or if you happen to be wearing gloves on the job.

You can change the chuck in some keyless models with only one hand because the shaft locks when the trigger is off. In most models, however, you have to use both hands to turn the chuck in opposite directions. While you're in the store, change the bit on different drills to see what style of keyless chuck you prefer.

Hammer action
The hammer action function moves the drill chuck rapidly in and out as it turns, causing the drill bit to hammer its way into bricks and masonry. On most drills the hammer action is created by a ratchet mechanism, which makes the chuck jump up and down as it rotates. This type of action requires pressure to be applied by the user - the harder the material, the more pressure - and that can be tough on the drill bearings after prolonged use.

Most models with hammer action have a switch to select/deselect the hammer action, this adds to the versatility of the drill.

When using a hammer action, a drill bit specially produced to take the punishment of the hammering at a few thousand revs per minute must be fitted.

Handles
Most drills have a pistol grip with the speed control trigger built in to it. Heavier and more powerful drills also need a second handle, located just behind the chuck so that the drill can be held steady with two hands when in use. Ideally it should be possible to change the position of the second handle so that it is comfortable to hold.

Some drills are designed to be held with the hand around the main body of the drill, thumb one side, fingers the other; with the third and little fingers operating the trigger. The advantage of this hold is that the forearm is in line with the drill bit, allowing more pressure to be put behind the bit, and it's easier to keep the tool steady. Such drills have a curved recess in the body, but some are more comfortable than others. Users with small hands will find it awkward to hold some drills and operate the triggers.

Always pick up a drill and try it in your hands for comfort before buying. Are the trigger and other controls easy to operate? Does the tool feel balanced?

Depth Stop
Some electric drills incorporate a drill depth stop which prevents the drill bit from going into the workpiece too far. These usually consist of an adjustable metal rod that can be locked in place. Such depth stops are often useful, but it helps if it can be removed from the drill when not required.

Screwdriver function
For an electric drill to perform double duty as a screwdriver, it needs to have variable speed plus two functions - torque control and a reverse drive.

-Speed Control
When using a drill as a screwdriver, a fairly low speed is necessary, so it is essential that the drill has a variable speed control. As mentioned earlier, this is usually accomplished by how far the trigger is pushed in.

-Torque Control (adjustable clutch)
Torque controls are normally found on drills with a screw-driving function. This is nothing more than a built-in adjustable clutch. An adjustable clutch is what separates electric drills from cordless drill/drivers. Located just behind the chuck, the clutch disengages the drive shaft of the drill, making a clicking sound, when a preset level of resistance is reached. The result is that the motor is still turning, but the screwdriver bit isn't.

Why does a drill need a clutch? It gives you control so you don't strip a screw or overdrive it once it's snug. It also helps protect the motor when a lot of resistance is met in driving a screw or tightening a bolt.

The number of separate clutch settings varies depending on the drill; better drills have at least 24 settings. With that many clutch settings, you can really fine-tune the power a drill delivers. Settings with the lowest numbers are for small screws, higher numbers are for larger screws. Most clutches also have a drill setting, which allows the motor to drive the bit at full power.

-Reverse Drive
So that an electric drill can be used as a screwdriver it needs a reverse facility to remove screws. Selection of the reverse drive is normally by a switch selector.