SOFTWARE & TECH

How To Sharpen Drill Bits

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Introduction: Why Sharp Drill Bits Matter

Every DIY enthusiast, woodworker, or metal fabricator knows the frustration of a drill bit that just won't cut. Instead of gliding through material, it skips, smokes, or requires excessive pressure. The culprit is almost always a dull cutting edge. Learning **how to sharpen drill bits** is not just a money-saving skill—it transforms your drilling experience, extends the life of your tools, and delivers cleaner, more accurate holes. In this comprehensive guide, you will discover the tools, techniques, and best practices to restore a razor-sharp edge to your twist drills, masonry bits, and more. Whether you use a bench grinder, a dedicated sharpener, or even a simple file, this article covers everything you need to know.

Why Drill Bits Get Dull

Before diving into sharpening methods, it is helpful to understand what causes dullness. A drill bit’s cutting edge is precisely ground at specific angles. Repeated use generates friction heat, which can soften the hardened steel. Hard materials like stainless steel, concrete, or abrasive wood can physically wear down the tip. Over time, the edge rounds over, chipped, or develops a shiny “wear band.” Recognising these signs early—such as increased drilling effort, burning smell, or oversized holes—tells you it is time to sharpen.

Types of Drill Bits and Their Sharpening Needs

Not all drill bits are created equal. The sharpening technique depends on the bit material and geometry:

- High-speed steel (HSS) bits: Most common for metal and wood; can be sharpened on a bench grinder or with a diamond file.
- Cobalt bits: Harder than HSS; require a grinding wheel designed for hardness.
- Carbide-tipped bits: Used for masonry or tile; cannot be resharpened with standard abrasives—need diamond wheels or professional service.
- Titanium-coated bits: The coating wears off; sharpening removes the coating but the underlying steel still cuts.
- Brad-point bits: Have a central spur and outer cutting edges; require careful alignment.

Essential Tools for Sharpening Drill Bits

Having the right equipment makes **how to sharpen drill bits** much easier. You don’t need a workshop full of expensive gear—start with what you have and upgrade gradually.

- Bench grinder: The fastest method for HSS bits. Use a fine-grit wheel (e.g., 80–120 grit) and a dressing tool to keep the wheel flat.
- Drill bit sharpener (e.g., Drill Doctor): A dedicated device that automatically sets angles. Best for beginners or for high-volume sharpening.
- Flat file or diamond file: For manual touch-ups on small or specialty bits. Requires patience but works anywhere.
- Angle gauge or protractor: To check the 118° standard point angle (or 135° for harder materials).
- Safety gear: Safety glasses, gloves, and a dust mask. Metal particles and sparks are hazardous.

The Anatomy of a Drill Bit Point

To sharpen effectively, you must understand the geometry. The standard twist drill has a point angle of 118° (included angle between the two cutting edges). The cutting edges (or lips) must be equal in length and symmetrical. The relief angle behind each cutting edge (the clearance angle) allows the bit to penetrate without rubbing. A typical clearance angle is about 10°–12°. When you sharpen, you recreate these angles precisely. Even a small asymmetry will cause the drill to cut oversize and wobble.

Method 1: Sharpening Drill Bits on a Bench Grinder

This is the classic method used by machinists and tradespeople. It takes practice but gives full control over the final edge. Follow this step-by-step guide.

Step 1: Prepare the Grinder

Ensure the grinding wheel is true and clean. Dress the face with a dressing tool if it is glazed or uneven. Set the tool rest to a 59° angle (half of 118°) relative to the wheel face. Some grinders have an adjustable table; if not, use a magnetic angle block or simply hold the bit freehand.

Step 2: Position the Drill Bit

Hold the drill bit with the cutting edge facing the wheel. The axis of the bit should be at 59° to the wheel face. Twist the bit slightly so that the cutting edge is parallel to the wheel surface. This is the most critical part—get the orientation right, and the rest follows.

Step 3: Grind the First Cutting Edge

Lightly touch the cutting edge to the wheel. Use a smooth, sweeping motion: move the bit from left to right while maintaining the angle and creating a slight relief (the heel of the cutting edge should be ground slightly more than the tip). This relief is achieved by rotating the bit slightly as you move it across the wheel. Only grind until you see a small burr form on the back of the edge—do not overheat. Dip the bit in water after a few seconds to keep it cool.

Step 4: Grind the Second Cutting Edge

Rotate the bit 180° and repeat the exact same motion. The goal is to create a second edge identical in length and angle to the first. Check symmetry by eye: when you hold the bit up, both edges should look the same. If one edge is longer, more grinding is needed on the shorter side.

Step 5: Check the Point Angle and Relief

Use an angle gauge to verify the 118° point angle. Also check the clearance by observing that there is a small gap between the heel of the edge and the grinding wheel. If the bit still drills poorly, you may need a steeper relief angle (increase the twist during grinding).

Method 2: Using a Dedicated Drill Bit Sharpener

Devices like the Drill Doctor take the guesswork out of **how to sharpen drill bits**. They are ideal for those who sharpen many bits or want perfect results every time.

Step 1: Select the Proper Grit

Most sharpeners accept both standard and carbide bits by swapping grinding wheels. Use a fine diamond wheel for HSS and a medium for carbide.

Step 2: Insert the Bit

Place the drill bit into the alignment guide. Rotate it until the cutting edge aligns with the marker. Tighten the collet.

Step 3: Sharpen

Place the bit into the sharpening port and turn on the machine. Slowly rotate the bit (the device often does this automatically or manually). The machine removes material evenly from both edges. A few passes are usually enough. Remove and inspect—both edges should be clean and shiny.

Step 4: Deburing

If a burr forms on the back of the cutting edge, use the included deburring slot or a fine stone to remove it. Your drill bit is now ready for use.

Method 3: Hand Filing (for Small or Specialty Bits)

When you lack power tools or need to touch up a tiny bit (1/16 inch or less), a fine diamond file or sharpening stone works well. This method is slow but precise.

Step 1: Clamp the Bit

Secure the drill bit in a vise or use a pin vise to hold it steady. Orient the bit so the cutting edge is accessible.

Step 2: File the Cutting Edge

Using a fine diamond file (400–600 grit), maintain the original angle (about 59° from the bit axis). File in one direction only (pull strokes). Count the number of strokes and repeat an equal number on the opposite edge. Check symmetry often with a magnifying glass.

Step 3: Create Relief

After the cutting edge is sharp, gently file a small secondary bevel behind the cutting edge to create clearance. This is tricky freehand; only remove a tiny amount.

Common Mistakes When Sharpening Drill Bits

Even experienced DIYers make errors. Avoid these pitfalls to get consistent results:

- Overheating the steel: If the tip turns blue or brown, the temper is ruined. Quench frequently in water.
- Uneven edges: This causes wobbling and oversized holes. Always check symmetry after each pass.
- Wrong point angle: 118° is standard for most materials; 135° is for harder metals. Using the wrong angle reduces performance.
- Excessive grinding: Remove as little metal as possible. A few seconds of grinding is often enough.
- Skipping the relief angle: A sharp edge with no relief will just rub, not cut.

When Not to Sharpen: Replacement vs. Resharpening

Some drill bits are not worth the effort. Very cheap HSS bits may cost less than $1 each—your time is better spent replacing them. Carbide masonry bits can be sharpened only with diamond wheels, and even then only a few times before the carbide cracks. Also, bits that are severely chipped or broken may require so much metal removal that the geometry is lost. In those cases, buy new bits. However, quality bits from reputable brands (e.g., Bosch, Dewalt, Freud) are excellent candidates for sharpening and will last through many resharpenings.

Maintaining Sharp Drill Bits

Once you have mastered **how to sharpen drill bits**, adopt habits that keep them sharp longer:

- Use cutting oil when drilling metal to reduce friction heat.

- Peck drill deep holes (lift the bit frequently to clear chips).
- Do not use wood bits on metal—they are designed for different speeds.
- Store bits in a case or drill index to prevent edge contact.
- Clean bits after use with a wire brush to remove resin or buildup.

Conclusion

Knowing **how to sharpen drill bits**is a valuable skill that saves money, reduces waste, and improves your drilling accuracy. Whether you opt for a bench grinder, a dedicated sharpener, or hand files, the principles remain the same: maintain the correct point angle, create symmetrical cutting edges, and ensure proper relief. With practice, you will be able to restore a dull bit to like-new condition in minutes. For most home workshops, a simple bench grinder and an angle gauge are enough to keep your drill bits performing at their best. So gather your dull bits, set up your sharpening station, and bring new life to your tools—your wrists and your projects will thank you.

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