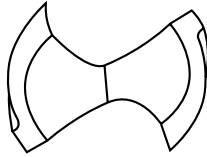


## THE PERFECT POINT DRILL

The drill is one of the most basic general purpose cutting tools found in the shop today. As such, most of the changes made to the fundamental drill design have been a result of years of design evolution rather than innovation. However, despite this normal course of events, every so often a completely new and radical design is achieved. One such case is the *Perfect Point* drill from ICS Cutting Tools in Casco, WI.



The *Perfect Point* drill represents a substantial departure from other conventional, general purpose, twist drill designs. While the overall body configuration is basically the same as other twist drills, the design of the point is unique. The point resembles a modified form of a flat-bottom drill. However, rather than using only the traditional flat-bottom arrangement, this drill also includes a helical or spur-style point and a special edge chamfer. Together, these elements create a drill point with six individual cutting edges. This ingenious point geometry produces a unique cutting action that allows the drill to function much like a center-cutting end mill. So, rather than employing a customary drilling action, the drill acts more like a rigid, multi-flute boring tool.

This point geometry offers advantages not found with other conventional or specialty point styles. Most notably, these include an improved cutting action that generates superior surface finishes with excellent drilling precision and accuracy. This design also provides excellent stability while substantially reducing the chatter and vibration so common with other drill point shapes. The drill combines the best features of metal and wood cutting drills and is well suited for drilling holes in a variety of materials. It may be used for drilling ferrous and nonferrous metals, natural and composite wood products, and a range of plastics and similar manufactured materials. Unlike other point designs, the *Perfect Point* geometry consistently produces perfectly round and uniform holes with no metal burr breakthrough or wood grain tears and splinters in virtually any material thickness.

Another very useful characteristic of this point structure is its almost unnatural ability to stay sharp. While the tests performed on these drills were not scientific, they did compare *Perfect Point* drills with normal twist drills for drilling the same number of holes in selected materials. This side-by-side comparison evaluated the *Perfect Point* for drilling 25 holes in each of the following materials: aluminum (7075-T6), cold rolled mild steel (1020), and hot rolled alloy steel (4140). Two standard twist drills were required for the 75 holes while a single *Perfect Point* drill completed all the holes with very little sign of wear.

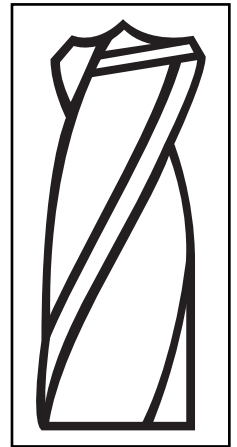
Though the wide assortment of coatings available for these drills can partially explain this significant endurance, the unique point geometry undoubtedly contributes to this exceptional durability and wear resistance more than any special coatings. The *Perfect Point*, by virtue of its general form, is ground with considerably less relief than most standard drill points. Each of the cutting edges is formed with flatter relief angles that yield a substantial amount of supporting material behind the individual cutting edges. This added material helps to support the cutting edges by absorbing the cutting forces and dissipating the heat generated in drilling.

The *Perfect Point* drill was developed by ICS to answer to a particular problem one of their customers encountered. They needed to drill a large number of holes through planks made from

a very dense grade of oak into a stainless steel frame. This combination of metal and wood created a variety of problems. First, the resin in the oak caused the wood chips to cling to the body of standard twist drills they first tried. This retained the heat and blocked the excavation of the stainless steel chips. Ultimately this excessive heat drew the temper from the drills after just a few holes. However, with the *Perfect Point* drill, the holes were cut very cleanly with no tearing or splintering of the wood nor burrs in the stainless steel. The addition of a TiN coating on the drill further increased the endurance of the drill and helped resolve the chip-packing problems by completely eliminating the tendency for the wood chips to stick to the drill.

Although initially designed to drill through layers of both wood and metal, this point design will work equally well for drilling either material exclusively. By the nature of the basic shape and the holes the various sizes produce, these drills can be used in place of many other standard drill types, as well as a few other cutting tools. For drilling wood, in addition to being used as regular drills, the appropriate sizes can be used in place of Brad point drills and Forstner bits, with metal, they can be used in place of a variety of heavy duty or reduced angle point shapes. They can also replace flat bottom drills, spotfacing tools, and counterbores for some applications.

When used to counterbore holes for socket head cap screws, hex head screws and bolts, or other hardware items, it is important to remember the proper drilling sequence, unlike the normal practice of producing counterbored holes by first drilling the body diameter hole, then cutting the counterbore, the drill simply reverses the drilling order. With the *Perfect Point* drill, the counterbore diameter is first drilled to the proper depth. The hole for the body diameter of the screw is then drilled. Here, the residual point depression left after drilling the initial counterbore hole offers an accurate starting point for drilling the next hole.



The major design element that makes *Perfect Point* drills unique is the overall configuration and geometry of the drill point. Therefore, virtually any standard twist drill body style can be furnished with the *Perfect Point*. Although the different drills are most commonly available in standard jobbers' lengths, they are also available as stub length and taper length drills and a selection of extended length drills. Likewise, they are available with several different shank styles, including standard straight shanks, 3/8" and 1/2" reduced diameter shanks, and the complete range of Morse taper shanks.

A selection of surface treatments or coatings is also available to suit special drilling situations. Here, the most popular surface treatments for these drills are black oxide, bright finish, and Titanium Nitride (TiN). However, several other surface treatments, including gold finish, gray finish, Titanium Carbonitride (TiCN), Titanium Aluminum Nitride (TiAlN) and Zirconium Nitride (ZrN) are also available on request.

NOTE: The contact for inquiries, information, and responses about these drills is: John Jaconi - President  
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