



Key Factors To Consider When Specifying a Blade Bevel for Industrial Blades

Cutting tools work because they are able to penetrate into the material being cut, be it metal, wood, plastic, fabric, food, or a myriad of other materials. In order to penetrate into the material, cutting tools have to have at least one bevel, and machine blades and hand knives are no different. A bevel is the sloping surface coming off the edge of the tool, and it is this “angle” that actually allows the tool to make a cut.

A bevel serves two purposes. First, it creates a strong, durable and reliable cutting edge on the cutting tool, allowing the tool to present a sharp edge to the material being cut or sheared – it allows the tool to penetrate the material. Second, it minimizes the amount of material deformation caused by the tool’s penetration – it lets the tool cut without destroying the material.

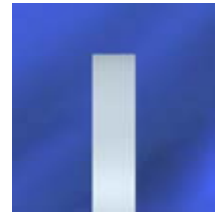
The bevel is the transition point between the main body of the tool and the outermost point of its cutting edge. It’s also the area of compromise between the qualities of strength and penetration.

There is a direct correlation between a blade’s strength or durability and its penetration or ability to cut - as one property increases, the other decreases. The trade-off is due to the fact that penetration is gained by removing more of the tool’s base material, thus reducing its strength and durability. Although typically we want a blade to last as long as possible, certain applications require more penetration in order to achieve the desired result.

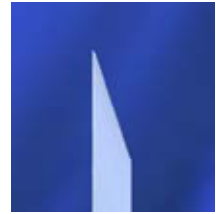
The bevel angle, or the length of the bevel, determines what materials the tool can cut and how the tool can be used. The greater the bevel angle, the steeper and shorter the bevel. A greater angle means more cutting strength on the edge, and the stronger the edge, the harder a material you can cut.

There are three basic types of bevel configuration:

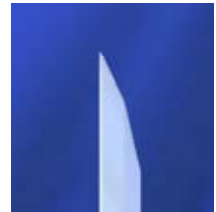
- Square Edge – no bevel – the cut is a square-edge cut – this type of edge actually creates a “shear fracture” of the material rather than a cut (i.e. metal shear blades)
- Single Bevel – beveled on one side only – the cut is half square-edge and half vee-cut
- Double Bevel – beveled on both sides of the blade – the cut is a full vee-cut



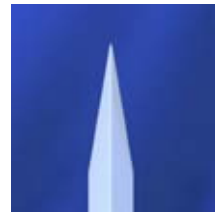
Square Edge –
no bevel



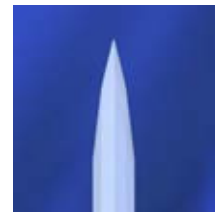
Single Bevel -
basic



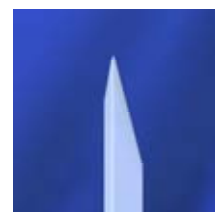
Single Bevel –
compound angle



Double Bevel -
basic



Double Bevel –
compound angle



Double Bevel –
asymmetrical

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The main bevel angle (sometimes the only bevel angle) is called the primary bevel. On many blades, there is a shorter, second bevel, between the main bevel and the cutting edge and this is called the secondary bevel. When a blade has both a primary and secondary bevel, that is referred to as a compound angle bevel.

Single bevel blades are better suited for heavier materials and slower speeds. Single bevel blades are often found in trim-type applications, where a clean, finished edge is desired after the cut. Double bevel blades are better suited for medium to lighter materials and faster speeds, and are the most common design in use today for almost all industrial slitting markets.

