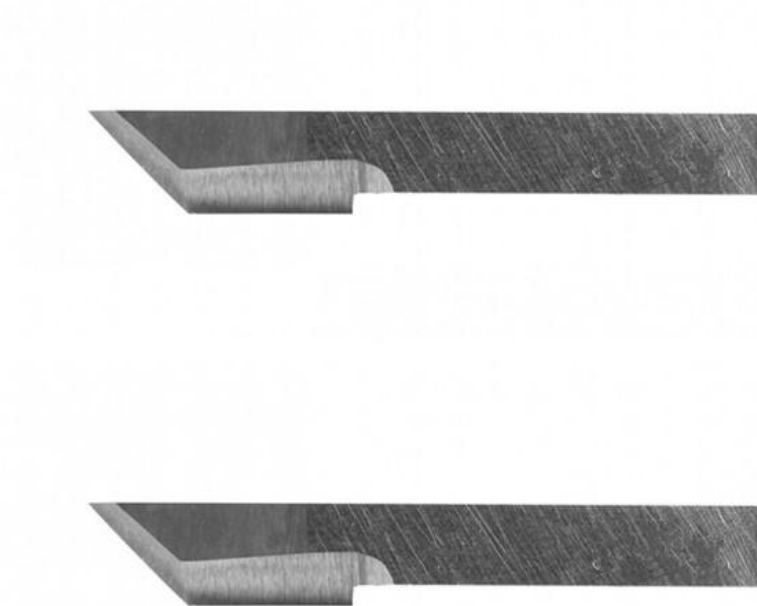


About CNC router drag knife blades and how it cuts



The movement of the drag [knife](#) is usually provided by a non-powered cutting module or tool, depending on the specification and manufacturer of the CNC plotter. The cutter blade is fixed in the [knife](#) mount and in some models, if the blade is mounted at an angle, it rotates around the axis of the knife holder when turning and cutting corners in a web.

A "[drag knife](#)" follows the tool holder trajectory as it cuts. In order to change direction smoothly, the blade is typically pivoted in the

tool holder.

Drag [knives](#) move and cut through the material like a knife cuts through butter. Since the cutting motion with the drag knife technology is dragging, these [knives](#) are usually used to cut thin materials (adhesive vinyl), flexible materials (corrugated cardboard) or thicker materials but soft materials (foam board). But more typically the drag knife is used to cut self-adhesive vinyl for manufacturing stickers, stencils and labels. Cutting thicker or rigid media with drag knives may result in slight distortions or rounded corners on the material.

The drag [knife](#) has different designs depending on the CNC cutter type and its application. In addition to the design, the knives differ in such characteristics as:

cutting depth

shape of the knife shank: flat or rounded

cutter offset

pre-cut

post-cut characteristics (in case of a [knife](#) with two cutting sides)

material from which the knife is made angle of the cutting side in

relation to the cutting surface: 36° , 45° , 55° , 60°

number of sharp cutting sides: single and double-sided knives

Cutting angles of knives for digital cutters - oyea

It should be noted in turn that with drag knives, a smaller cutting angle means less drag force.

The drag digital cutting [knife](#) moves through the material without completely withdrawing from the material, even when turning to change the cutting direction. To change the cutting path, the knife is lifted slightly and turned in the desired direction and then lowered again to the desired depth to continue cutting, resembling the movement technique of a tangential [knife](#). Therefore, sometimes on thicker and softer materials, the places where the knife changed angle and trajectory on the turn may be more noticeable. However, with tangential cutting, the [knife](#) is lifted completely out of the material, rotated and lowered into the material already with the correct position of the cutting path, which ensures the best and smoothest corners on the material being cut.

Tangential knife technology is typically found only in flatbed cutters.

Applications of drag knives in CNC digital cutters

Drag [knives](#) are usually less expensive among other CNC knife options. They are also more durable. They are suitable for cutting a wide range of materials, from thin materials such as films, vinyl, paper, fabric, to thicker materials such as carton, cardboard, RE-board, rubber mats, PVC, polypropylene. But ultimately, drag knives are best suited for thinner and more flexible materials such as vinyl, thin plastic, paper and thin cardboard.

Drag blade cutting on CNC digital cutters is often used to create labels, stickers, signage, decals, packaging and prototypes, craft and apparel.

Cutting angle of the CNC cutter blade

In digital cutting knives, the cutting angle is measured as the distance in degrees from the flat cutting surface to the sharp end of the knife. Thus, the larger the specified cutting angle of the knife, the sharper its end is ($90^\circ - \text{cutting angle}^\circ = \text{blade tip sharpness}^\circ$).

