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Beyond the basics 3: **Slotters**

Slotters aren't the first cutters to come to mind when you're looking to expand your basic cutter collection, but that's mainly because most router users aren't aware of their versatility and all-round usefulness. I hope to change all that...

S lotters – also known as groovers – resemble small-scale circular saw blades. General-purpose ones come in diameters ranging between 30 and 60mm, with a blade thickness – the equivalent of a saw's kerf width – from 1.5mm to 10mm. The smallest of them have just two teeth; heavy-duty ones have four or more, **photo 1**.

Beyond these standard slotters, specialpurpose ones are available in diameters up to 100 mm, and with up to 12 teeth.

Slotters are rarely found in the smaller starter sets of 12 or 15 router cutters, but larger sets such as the Trend and Axminster 30-piece sets include at least one, **photo 2**.

Anatomy of a slotter

Basic budget slotters are made in one piece, blade and shank together, but most slotters have the blades and shanks separate. Shanks are in the form of an arbor on to which one or more blades are assembled. Arbors come in the usual range of shank sizes: ¼in, 8mm and ½in. The other crucial dimension is the bore diameter of the cutter. Bores include ¼in, ¾in, ½in and 8mm, and it's important that you match the cutter bore with the arbor. This is not a problem if you buy a complete set such as the one shown in **photo 3**.

Stacking cutters

Arbors are made long enough to take several cutters at once so that grooves of varying thickness can be achieved by stacking two or more cutters together. A typical set provides for grooves from 3 mm to 18mm in 0.1 mm increments. Spacers and shim washers are provided to separate the cutters and take up unused length on the arbor. Slotters should be mounted as close to the shank as possible to minimise



Large slotters have more teeth than smaller ones

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whip and chatter. It is also vital that the slotter is fitted to the arbor the correct way round with respect to the direction of rotation, **photo 4**.

Depth of cut

The maximum depth of cut with a given cutter depends on the blade diameter and on the diameter of the arbor or spacing washers. Actual depth of cut is controlled either by adding a bearing to the arbor or by using the router side-fence or table fence. The fences work only for straight cutting.

Some of the quality slotter sets are supplied with several bearings of different outside diameters for different depths of cut, as shown in **photo 3**.

Hand or table

Slotting cutters can be used in hand-held or table-mounted routers. They give a fast cutting rate and a clean finish, and can be used successfully with low- and mediumpowered routers.

With hand-held use, the biggest problem is usually that of tilt. It's essential that grooves are cut parallel to the surface of a board – slight tilting could ruin the alignment of two boards being joined.

There are several methods of preventing tilt. One is to fit a base extension – preferably of clear plastic – to your router and run the outer edge of it on a packing piece of the same thickness as the workpiece. With a wide board or panel, the extension could be made large enough on the inboard side to run on the panel and prevent tilt. If made of clear plastic, the extension can also be marked with the centre line of the cut to help with accurate positioning.

A more sophisticated anti-tilt measure is to fit a form of outrigger on a special set of fence rods. The outrigger rides up and down on the rods by means of vertical slots cut in it. The one in **photo 5** was devised by woodworking author, Bob Wearing.

Arbor trouble

The other problem with hand-held slotting is the length of the arbor, which usually projects below the cutter and bearing. The

WORKSHOP Router cutters 3



A set dismantled: arbor, nut, spacers, bearings and blades





Two ways of preventing tilt: the levelling foot (left) and the Perspex base extension



There's no tilt problem with table-mounted slotting

solution is to raise the workpiece (and packing) to give clearance to the arbor.

With table routing, neither of the above two problems arises. So long as your workpiece and router tabletop are flat, you cannot tilt the workpiece, and the excess length of the arbor comes above the workpiece, **photo 6**.

Incidentally, it's often easier with table router work to install the arbor in the router and then assemble the slotter, bearing and spacer washers onto it.

Centring the cut

With some applications, such as making tongued and grooved joints, the cut in the



Make a cut, then turn the workpiece over and make a second one to leave the groove centred

grooved board must be centred so the joint is level when the two components are assembled. A fine height adjuster is essential for this purpose, but rather than spending a long time tweaking it to get exact centre, you can use a simple trick to do the job.

Set the cutter as near centre as possible, cut a groove in a short length of board, then turn it over and make a second cut. If your first setting was not dead centre the second pass will widen the cut slightly but leave the groove dead centre, **photo 7**.

If the groove must be the exact width of the slotter, slide the grooved board over the cutter and centre it in the groove by eye,



You can also centre the cut by eye using the fine adjuster

using your fine adjuster. This is a useful trick with many applications, and works for both hand-held and table routing, **photo 8**. The tongue in the mating board will be automatically centred since you work from both faces, and a test cut will determine the exact height setting.

FURTHER INFORMATION

Trend

- 0800 487363
- www.trenduk.com
- Wealden
- 0800 328 4183
- www.wealdentool.com



SEVEN SLOTTER APPLICATIONS

1: Rebating

Special rebating cutters are available that resemble one-piece slotters with a deeper cut, but smaller rebates can be cut with standard slotting cutters. With a bearing fitted, rebates can be cut in straight or curved work, **photo 1**.

2: Splined joints

This is a traditional method of edge-joining boards for table tops and the like. It's also known as a loose tongue and groove joint. A groove is cut in the edge of each board, and a tongue of thickness equal to the groove is cut and glued into them. Plywood makes a convenient tongue material, **photo 2**.

If you haven't got a slotter the exact width for the tongue, a slightly thinner one can be used and the two-stage cut described in the main article can be made to centre and widen the groove.

If you have a slotter of exactly the right kerf for the tongue, you don't have to be fanatical about centring the cut exactly. Work from the face side of each board and they'll be aligned even if the grooves are slightly off-centre.

If the board ends are to be visible after jointing – for example, in a table top – the joint can be stopped before each end of the cut and the ends of the tongue rounded to fit the groove ends.

3: Tongue-and-groove joints

These are similar in principle to the splined joint, but the tongue is now formed on one of the board edges. As with rebating, dedicated pairs of cutters are available to make the joint, but standard slotters can also be used. With this joint, the groove is cut first and must be dead centre. The tongue cut is then set by aligning the two cutters with a grooved board, **photo 3**.

The fit of the joint can be adjusted by varying the distance between the two tongue cutters by means of spacing washers.

4: Biscuit joints

Contrary to some views, the most common biscuit joints such as edge-jointing boards can be made very easily and accurately with the router. Done properly, there is less chance of tilting the blade and getting misaligned slots. With the small diameter of biscuit slotters, however, the router (or the workpiece in the table) has to be moved to make the slot long enough.

Dedicated biscuiting sets consisting of a 4mm thick cutter, an arbor and three bearings are available from Trend and other suppliers. The bearings control the depth of cut for each of the three standard biscuit widths.

For hand-held biscuiting, you'll need one of the anti-tilt measures described earlier; with table biscuiting this doesn't apply. The bearings are not strictly necessary; depth of cut can be set with the router side fence or the table fence, and simple depth-of-cut gauges can be made, **photos 4 & 5**.

5: Simple panelled work

Slotters are ideal for making simple small panelled doors, where the usual door-making cutters are too big and florid, **photo 6**.

Apart from a saw to cut the wood, the door components in photo 6 were made using just two slotters: a 4mm one to biscuit the boards for the panel, and a $\frac{1}{4}$ in one which did all the rest – grooving the frame, cutting the tenons on the rail ends and rebating the edge of the panel to fit in the frame. The completed door was part of a little key cupboard, **photo 7**.

6: Parting box lids

Wealden supply a large six-wing groover with an extra-long arbor, which is ideal for parting off the lids of boxes. The groover is only 1.5 mm thick, so the cut is extremely thin and separates the lid from the box with minimal loss of wood, **photo 8**. This is a particularly useful cutter for decorative boxes in highly-figured wood, since it minimises the break in the figure.

7: Fancy cuts

Trend supply several special two-winged slotters for making decorative cuts in the edge or face of boards, **photo 9**.

The round-nose cutter is useful for making small flutings, while the V-shaped one can be used to disguise glue lines. With a long arbor, such as the one in **photo 8**, the effects can also be applied to small panels, boxes and the like.



1 Straight and circular rebates, and the cutters used to make them



2 The splined joint has a loose tongue cut from ¼in plywood



aligned with the previously cut groove. The completed joint is shown in the foreground

3 The tongue cutter is

4 Hand-held biscuit jointing needs an anti-tilt device

5 Use a home-made gauge to set the depth of the biscuit cut on the router table

6 The components of a simple panelled door can be made using only two slotters

7 The completed door (left) looks perfect on this small cupboard

8 Separating the lid from a small box with a large six-wing groover





9 Two specialist slotters from Trend: one round-nosed and one V-shaped



