

No. 114

## Open dovetail joints with VS 600



A

### Description

The open dovetail joint is still, even today, a demanding solid wood corner joint in trade work.

"Open" means the teeth and dovetails are completely visible, i.e. not half or fully concealed.

They are traditionally made using hand tools and are a testament of the skill and ability of the carpenter/joiner. However, this work is time-consuming and the result must be perfect in order to be able to sell the item.



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The VS 600 with the SZO 14 and SZO 20 templates enables also with little practice a really quick, rational and above all precise creation of this wood joint.

Two templates are needed here: one for the teeth and one for the dovetails. The templates are therefore only offered as a set.

#### Areas of application

- Anywhere where open, visible teeth are desired and where importance is attached to a classic joint, e.g.:
- Corner joints for solid wood carcass furniture
- Making drawers
- Frame construction, e.g. box frames.

#### Advantages of this corner joint

- Visible corner joint
- High stability
- High-quality craftsmanship is shown
- Alternative decorative design option
- Workpieces do not slip during assembly
- Can be used for solid wood
- Saves time and costs
- Can be used for wood thickness of 10 - 25 mm:

#### Disadvantages of this joint

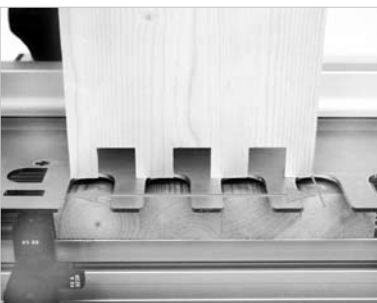
- Groove for rear wall or drawer base cannot be cut through
- Teeth spacing cannot be individually adjusted

#### Information on design

Care should be taken to ensure that a 1/2 tooth is at each of the corners of the object being produced. (arrow) The tooth spacing is, however, fixed for the templates. Therefore, there may be a dovetail at the other corner depending on the width of the board.



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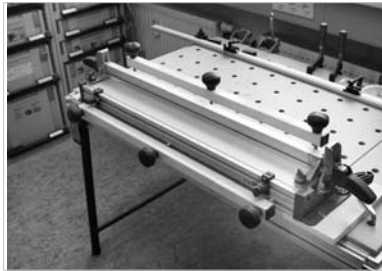


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In order to obtain a half-tooth at both corners, measure the distance from the left edge to the centre of the desired width at the dovetail template (see arrow in image). If the parts are cut to the width as per this distance, then two 1/2 corner joints are obtained. The drawer height or carcass depth can thus be designed according to this measurement.



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## B Tools/Accessories

Basic equipment:

Designation	Order No.
Router (Festool OF 900 E, OF 1000 EB, OF 1010 EB)	*
Jointing system VS 600 GE	488876

\*Please obtain the order no. from the Festool main catalogue or from the Festool website.

Equipment for wood thickness 10 -14 mm: (Image 06)

- Template kit VS 600 SZO 14 (Order No. 491152)
- Dovetail cutter 10 0, HM D14.3/16-VS 600 (Order No. 491164)
- Spiral groove cutter HM D6/16-VS 600 (Order No. 490762)

Equipment for wood thickness 14 -25 mm: (Image 114/07)

- Template kit VS 600 SZO 20 (Order No. 491153)
- Dovetail cutter 10 0, HM D20.26-VS 600 (Order No. 491165)
- Spiral groove cutter HM D10/30-VS 600 (Order No. 490764)

The sets contain the necessary copying rings and centering mandrel

HS cutters are also offered as an alternative. These have a shorter service life and are only suitable for soft wood.

Useful accessories (not included in scope of delivery)

- Centring mandrel. (The cone shape enables the exact centring of the copying rings, except the copying ring for toothed template of SZO 12. (Order No. 486035).
- Extraction hood: It makes possible effective chip extraction directly at the location where the chippings are produced. (Order No. 484453).

Dust extractor with extractor hose D 27

## C

# Preparation/Set-up

Need to know:

The creation of open dovetail joints is divided into two work steps:

1st work step: Cutting the dovetail using a dovetail template

2nd work step: Cutting the teeth using a toothed template

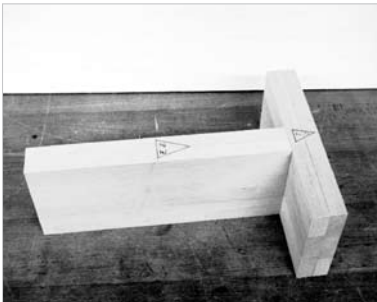
For each work step different cutters are used:

for the first you need a dovetail cutter

for the 2nd a spiral groove cutter.

Wood selection: There should be no branches in the front area!

Cut: Board length = Workpiece length



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In the case of drawers the **s**ide pieces typically have the **d**ovetails and the front and rear pieces the teeth.

- For drawers make marks on the top narrow surfaces.
- For carcass parts make marks on the front narrow surfaces.
- Mark a "**Z**" on the inner areas of the toothed pieces and a "**S**" on the inner areas of the dovetail pieces.

Note: The narrow areas with the markings always touch the stops during clamping.



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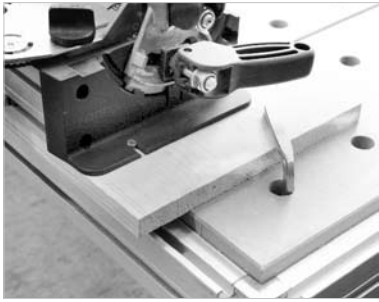
Preparation of router

- Mounting of the copying ring for the dovetail template (centre!).  
The copying ring has a safety ring. It prevents damage to the template.  
(If this is lifted during cutting, the cutter may groove through the template.)



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- Mounting of the intended dovetail cutter.



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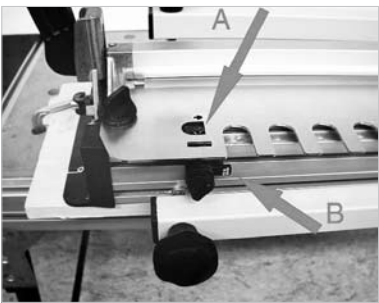
#### Preparation of VS 600

Clamp basic unit to workbench using fastening clamps. As the base frame must protrude over the front edge of the workbench, it makes sense to screw the base frame to a plate, thus enlarging the contact surface.



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- Insert the template into the countersunk holder. (The holder is centred).
- Insert the dovetail template into the holder fully. This template has no eccentric thumbwheels.



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- Position the adjustable stops on the front of the base frame into the slots on the template marked with an arrow so that the arrow marks on the stops touch the even edges of the slots on the routing template. (red arrow A)
- Turn the rotatable labelled stops in. Depending on the template used position the rotary stops to "SZ 14" or "SZ 20". The stops are facing to the centre of the basic unit. (red arrow B)
- Check the parallel distance of the template to the front edge of the base frame. If this distance is not parallel then please align the template.



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#### Splinter-free backing

It should be at least 5 mm thicker than the workpiece. This prevents damage to the base frame by the cutting tool.

- Position splinter-free backing under the template, lie against the left stop and align flush at the front edge of the VS 600. For this clamping a board vertically as a stop serves as an aid. Clamp splinter-free backing to upper pressure beam. It remains in this position until the end of this cutting work.
- Lower the template onto the splinter-free backing, align and clamp using the two side clamping levers.

#### Tip:

Place the second piece of splinter-free backing, which you require subsequently for cutting the teeth, underneath to the right. The template then lies flat.

## E

# Procedure

Note: Dovetail and toothed pieces are clamped vertically!

Use test pieces of wood to determine the exact routing depth. (Test pieces of wood always have the same thickness as the intended workpieces!)

1st work step: Cutting the dovetails



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- Clamp the workpiece, the front of the wood does not rub against the bottom side of the template, it is aligned precisely at the upper edge of the splinter-free backing.



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- The narrow area with the marking is at the left stop. There is a gap for the locking ring of the copying ring between the template and front of the wood.

The dovetail pieces can all be cut at the left stop. The marking is thus always facing the stop (if it has been marked on the visible narrow area). If dovetails are cut at two front areas of the wood, the inner area is positioned at the stop first and then the outer area.



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Adjusting the routing depth

- Position the router on the template and set the routing depth to the workpiece thickness.

Tip:

Use an original workpiece for this. (other pieces of wood)



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Mounting the extraction hood

- Insert the router fully into the template using the cutter. The pistol handle of the router is pointing left. Fit the extraction hood on the router. Ensure a distance of approx. 10 mm to the workpiece.





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### Cutting the dovetails

The router is guided by the copying ring. This is "invisible" during routing. You have to guide the router so that the copying ring always has contact with the teeth on the template.

- Push the router on the template away from the body to the front.
- The router cannot be lifted or tilted.
- When retracting guide the copying ring at the left template slot, when extracting at the right.
- "Blind" trace the contour of the template. The band of the copying ring must always touch the template edge.
- Routing path is from left to right
- Always leave the router in the lower position. Do not slacken the locking screws of the height adjustment at the router. The routing depth may vary.

Caution: Risk of injury in the case of protruding cutting tool!

Important:

- Always hold the router planar on the template. Lifting or tilting the router results in deviations in the accuracy of fit. Under no circumstances lift the router during routing.



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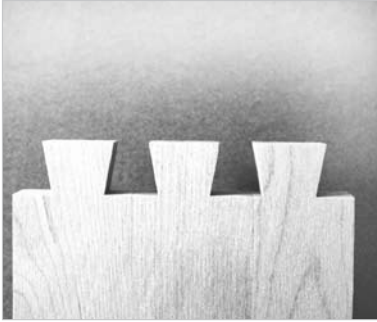
### Checking the routing depth

- Cut the first dovetail on a test piece of wood.



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- Hold the remaining piece of wood (or the toothed piece) at the cut-out. The dovetail should not protrude more than 3/10 mm, in no case should it be short. If necessary correct the routing depth using the precise adjustment of the router.



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- Cut all dovetail pieces
- Immediately after cutting check whether the dovetails have been cut the same. Cut again if necessary. Clamping at a later stage for subsequent cutting is inaccurate.

2nd work step: Cutting the teeth

#### A) Retrofitting the VS 600



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- Replace the dovetail template for the toothed template
- Insert the template into the countersunk holder.
- The black thumbwheels on the template are pointing downwards. These must be on the basic unit.
- Position the adjustable stops at the front of the base frame into the slots of the template marked with an arrow so that the arrow marks on the stops touch the even edges of the slots on the routing template. (red arrow)
- Depending on the template used position the rotary stops to "SZ 14" or "SZ 20". The stops are facing the centre of the basic unit.



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- Remove the clamping lever for the height adjustment, lift the template and position two pieces of splinter-free backing on the base frame. The splinter-free backing should be at the side stops and the front edge of the base frame. Clamp two short boards vertically here as an aid and then you can align the splinter-free backing easier.



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- The template is positioned directly on the workpiece.



## Splinter-free backing

You need two pieces of splinter-free backing in the 2nd work step.  
As described above, align these left and right and clamp.

### Note:

The toothed pieces are positioned alternately at the left and right stop.  
The markings are each facing the stop, the inner area touches the base frame so that the outer area is always visible!

## B) Retrofitting the router

Replace the cutter and copying ring. You now need the spiral groove cutter with the respective copying ring. (Centre the copying ring again)



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- Clamp the workpiece vertically for test cutting.
- The front of the wood touches the bottom side of the template.
- Marking at the stop.
- Set the routing depth (= Workpiece thickness ).
- Fitting the extraction hood.



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- Check the routing depth. Correct if necessary. For this it is necessary to remove the clamping screw for the height adjustment on the router.



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## Routing

Countersinking the teeth means that the area of the dovetails is milled out thus allowing the formation of the teeth.

- Guide the router in the template cut-out initially from the right (cutting in the same direction). This helps achieve splinter-free edges. Then in a clockwise direction trace the contour of the template and then mill out the area. Ensure that no residue remains.

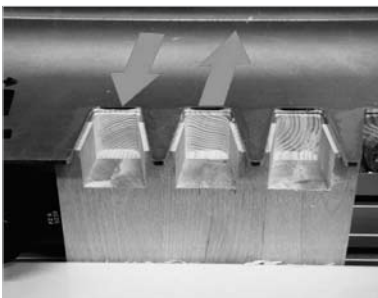
### Important:

Under no circumstances lift the router during routing. The copying ring slips straight away from the template guide. Result: The cutter damages the template.



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- Clamp workpiece and process the other side of the front of the wood.
- Marking is once again facing the stop, inner area touches the base frame.



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Check and adjust the accuracy to fit.

Connect the dovetail and toothed pieces. The following situations may arise:

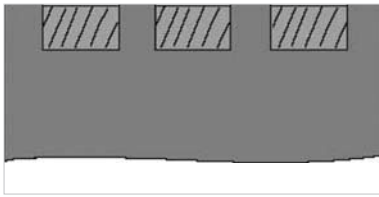
1. If the joint is too tight, the template must be moved parallel and horizontally to the back. The spacing between the teeth is thus enlarged.
2. If the joint is too loose, the template must be moved parallel to the front. The spacing between the teeth is thus reduced.



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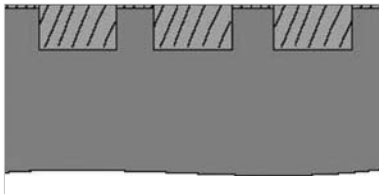
- You do not need to remove the template for setting and adjustment work. If you have found the right position through test cutting, cut all toothed pieces until complete.
- Then remove the splinter-free backing.
- Lower the template onto the base frame by removing the clamping lever.
- Adjust the thumbwheels so that these are now on the base frame.

The adjustment can thus be completed at the end of the first use of the VS 600 with the SZ014 or SZO 20.



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3. If the teeth are too long (front of the teeth is protruding too much), then the routing depth on the router must be reduced.



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4. If the teeth are too short: (dovetail piece protrudes over toothed piece), then increase the routing depth.

When changing the cutting setting remove the router table clamp, correct the routing depth using the precise adjustment.



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Completed joint

Tip:

If you work often with the same wood thickness, then keep a custom-fit corner sample as a setting gauge. If you have worked with another template in the meantime, clamp the test pieces of wood to set the routing depth. You should, however, perform a test cut.

Tip:

You can join workpieces with different thickness. For the dovetail piece adjust the routing depth to the wood thickness of the toothed piece and vice versa. The wood thickness must be within the ranges intended for SZO 14 or SZO 20.

Tip:

The optimal extraction effect during cutting with spiral groove cutters is achieved when two extractor hoses are used: one hose is connected at the router table, the other at the extraction hood. A star connector joins the hoses to the dust extractor.



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