FESTOOL

No. 100

# Semi-concealed dovetail joints

## A Description

The semi-concealed dovetail joint is a classic solid wood corner joint. It is suitable for joining wider slats, boards and solid wood panels.

Semi-concealed means the joint is only partially visible. The front ends of the dovetails are hidden. The "cover" is a result of the teeth being partly countersunk, and not free-standing.

100/01

The length of and gaps (spacing) between the dovetails are determined by the routing template. Therefore, Festool offers two different routing templates for the jointing system VS 600. The choice of the routing template depends on the thickness of the wood used:

Routing template designation and use

- SZ 14 can be used for wood thickness of 14 - 20 mm (Fig. 100/1)
- SZ 20 can be used for wood thickness of 21 - 28 mm (Fig. 100/1, left)

Thus wood with a thickness from 14 - 28 mm can be processed.

Areas of application

Anywhere where open, visible teeth are not desired, but where importance is attached to a classic joint.

- Drawers (with or without double panels).
- Carcass furniture with protruding lid.
- Frame designs (box frame).

100/02

Advantages of this joint

- High stability.
- Grooves for floors and rear walls can be milled through (The grooves are concealed by the dovetails. No inset routing necessary. Saves time!). Fig. 100/2
- Only needs to be clamped in one direction when gluing (Less clamps are required. Saves time!).
- Can be created relatively quickly (good for small series production).

Disadvantages of this joint

- It is only partially visible.
- Thickness of the cover is dependent of the thickness of the wood (visible disadvantage).

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Information on design

Care should be taken to ensure that half a tooth is at the corners of each object being produced. The tooth spacing is, however, specified with the routing templates. Therefore, there may be a dovetail at the other corners depending on the width of the board. This does not necessarily meet the requirements for professional and proper work.

100/04

To obtain half a tooth at the two corners, measure the average distances between the teeth. If the parts are cut to the width of this distance, then two half-corner joints are obtained. The drawer height or carcass depth for example can thus be designed according to this measurement.

**Average distance**
**SZ 20 = 24 mm**
**SZ 14 = 17 mm**

**Sample calculation for SZ 20: 24 mm x number of teeth (e.g. 4 teeth) = 96 mm**

| | |
|---|---|
| **= full teeth** | **3** |
| **2 x half tooth** | **1** |
| | **4 teeth** |

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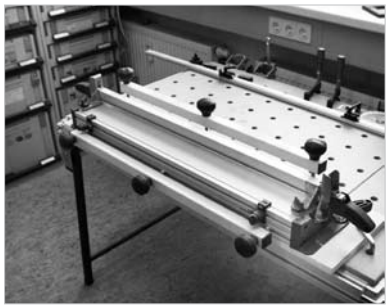

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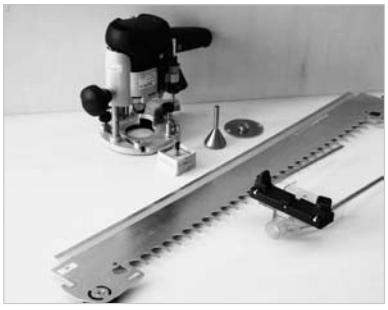
## B Tools/Accessories

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.



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Useful accessories (not included in scope of delivery)

| Designation | Order No. |
|---|---|
| Centring mandrel. (The cone shape enables the exact centring of the copying ring) | 486035 |
| Extraction hood: It makes possible effective chip extraction directly where the chippings are produced. | 488876 |

100/08

Dust extractor with extractor hose D 27

Equipment for wood thickness 14 - 20 mm:

- 1 dovetail unit SZ 14 (Order No. 488877)
- 1 copying ring KR D 17 (included in the scope of delivery for SZ 14).
- 1 dovetail cutter HS (Order No. 484963) for softwood or HW (Order No. 485411) for harder wood. Equipment for wood thickness 21 - 28 mm:

- 1 dovetail unit SZ 20 (Order No. 488878)
- 1 copying ring KR D 24 (included in the scope of delivery for SZ 20).
- 1 dovetail cutter HS (Order No. 490767) for softwood or HW (Order No. 490766) for harder wood.
- Tip: HW cutters are suitable for all wood types and have a longer service life.

## C Preparation/Set-up

There should be no branches in the front area!

Cut

- Toothed pieces:
  Cutting length = Outer dimension of the workpiece

- Dovetail pieces:
  Cutting length
  for SZ 14 = Inner dimension + (2 x dovetail length)
  = Inner dimension + (2 x 12.3 mm)

- Dovetail pieces:
  Cutting length
  for SZ 20 = Inner dimension + (2 x dovetail length)
  = Inner dimension + (2 x 15 mm)

100/09

In the case of drawers the side pieces typically have the dovetails and the front and rear pieces the teeth.

- For drawers make markings on the top narrow areas.
- For carcass parts make markings on the front narrow areas.
- 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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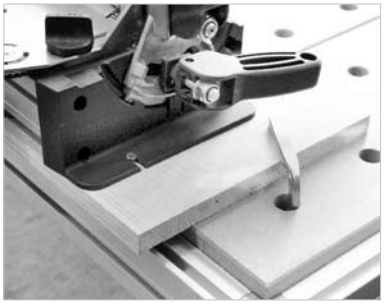
Preparation of router

- Mounting of copying ring (centring!).
- Mounting of intended cutter.



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Preparation of VS 600

- Clamp basic unit to workbench using fastening clamps

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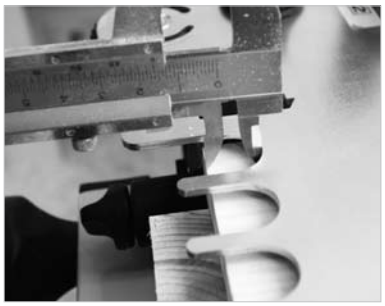
- Insert the template into the countersunk holder. (The holder is centred. The swivelling mechanism is only used for plugging.)

- The black thumbwheels on the template are pointing downwards. These must touch the basic unit. As the template may be slightly bent, ensure that it is inserted fully into the holder.

100/13

- 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 markings on the stops touch the even edges of the slots on the routing template.
- 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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- Please check (e.g. using a slide gauge) 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 and turn the corresponding thumbwheel of the template until its stop touches the base frame.

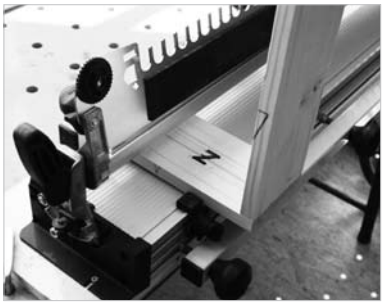
- Adjust the template to the workpiece thickness. For this open the two clamping levers, lift the template and position two small pieces of wood (whose thickness must be identical to the workpiece thickness) under the template ensuring that these are planar on the wood and clamp clamping lever.

## E Procedure

100/15

Clamping workpieces
Use test pieces of wood to adjust the template and determine the exact cutting setting. (Test pieces of wood always have the same thickness as the intended workpieces!)

- Basic information on clamping the workpieces:
  Both workpieces to be joined are clamped at the same time.
- Take the two respective workpieces (one toothed piece and one dovetail piece) and hold them at an angle so that they belong together as per the markings.

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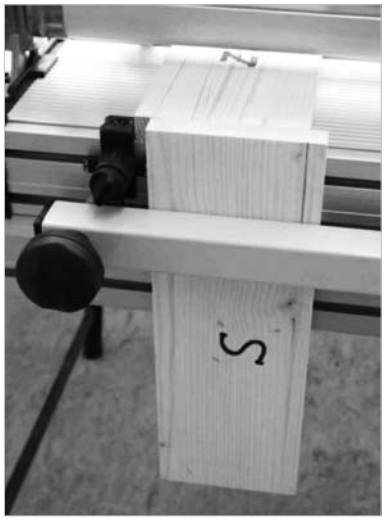
- The edge that should be cut is facing the front edge of the VS 600.
- Position the toothed piece horizontally on the base frame with the inner area facing up. The marking points to the stop.
- Fold the dovetail piece down. Correctly clamp the parts. (Always clamp only left or right!) The toothed piece "Z" is always horizontal on the base frame. Fig. 100/13

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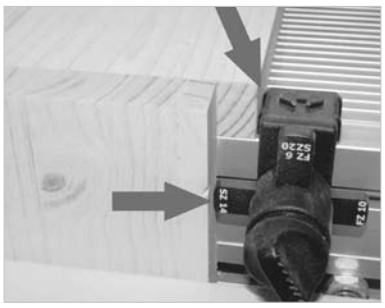
- The dovetail piece "S" is vertical at the front on the base frame. Fig. 100/14
- The outer areas of the clamped workpieces are touching the base frame. The inner areas are visible. The letters "S" and "Z" on the workpieces, which serve as additional markings, are recognisable!



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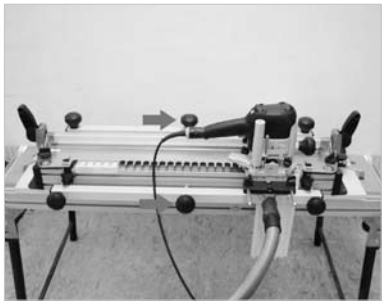
- The narrow areas with the markings are touching the stops.
- The front edge of the dovetail piece "S" is flush with the inner area of the toothed piece "Z".

- Note: Dovetail piece is clamped upright!
- Clamp the workpieces using the pressure beam. Insufficient clamping pressure may cause the workpieces to move during cutting. The work-pieces are then unusable!



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- For clamping narrow workpieces it is recommended to insert a pair of additional rotary knobs (accessories) in the centre bore hole of the pressure beam.

100/20a

Adjusting the routing depth for SZ 14

- Position the router on the template and set the routing depth to 12.3 mm.

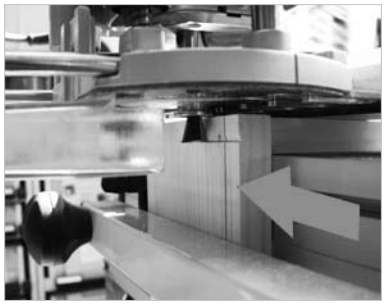
Adjusting the routing depth for SZ 20

- Position the router on the template and set the routing depth to 15 mm.

100/20b

Mounting the extraction hood

- Insert the router fully into the template. The pistol handle of the router is pointing to the left. (If cutting is effected at the right stop, the extraction connection of routing table A rubs off the right rotary knob of template holder B)
- Mount the extraction hood on the router. Ensure a distance of approx. 10 mm to the workpiece.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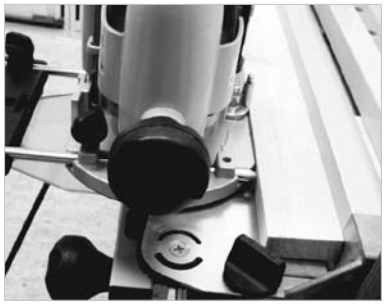
Routing

By exception to the general rule "Cutting in the counter direction", scoring in a rotary direction is effected initially. (Scoring = guiding the router from right to left). This avoids splinters at the routing edge.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A suitable auxiliary material for guiding the router is a guide rail: Width = Workpiece thickness + 28 mm. (Only applies if the piston handle is pointing to the left!)

Then cut in the "counter-direction" from left to right.

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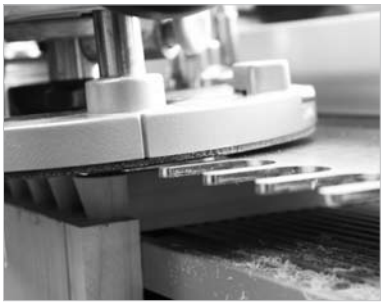
Note:

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

- "Blind" trace the contour of the template.



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- Never lift the router up during the work process (you will damage the workpiece)
- Always hold the router planar on the template. Lifting or tilting the router results in deviations in the accuracy of fit, Fig. 100/16
- Immediately after cutting check whether the dovetails have been cut perfectly round. Cut again if necessary. Clamping at a later stage for subsequent cutting is inaccurate.
- Do not slacken the locking screws of the height adjustment at the router. The routing depth may vary as a result.

Check and adjust the accuracy to fit.

Remove the workpieces after routing and insert the dovetails between the teeth. If the joint fits, then you can start work immediately.

- If the joint is too loose:

Enlarge routing depth using precise adjustment at the router. The cutter must be inserted further.

- If the joint is too tight:

Reduce routing depth using precise adjustment at the router. The cutter does not have to be inserted as deep.

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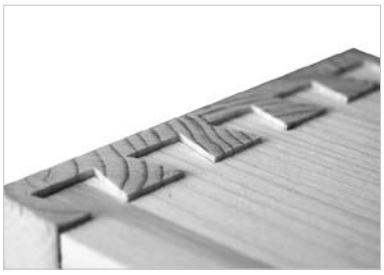
- If the teeth are too short: (Dovetail piece protrudes over toothed piece)

Move the template horizontally to the rear in the direction of the holder by the incorrect dimension.
(See description, image 100/27)



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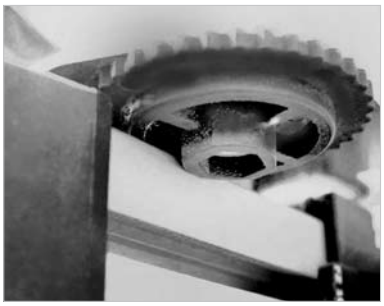
If the teeth are too long: (Teeth are too far over the dovetail piece)
Move the template parallel and horizontal to the front in the direction of the pressure beam by the incorrect dimension.
(See description, image 100/27)



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Several test cuts may be necessary until the correct setting is found.

Note:
If you have to move the templates, then countersink these before removal so that they are resting directly on the base frame.
Adjust the two thumbwheels on the template so that the eccentric stops are touching the front edge of the base frame.  When refitting you then have the correct setting "saved".

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Completed workpiece

Tip:
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.
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