



Making Stairs with Festool

Fast, Accurate Staircase Building on Site

What do I need?

1 x MFS 400 set

1 x MFS 700 set

1 x Router

1 x Copy ring, (Template Guide), 30mm is ideal

1 x straight cutter, (12mm used in this example)

1 bearing guided cutter, (12mm radius used in this example)

1 x extractor with hose to suit

Tape Measure

1 x framing square

1 x adjustable square

1 x Builders Pencil

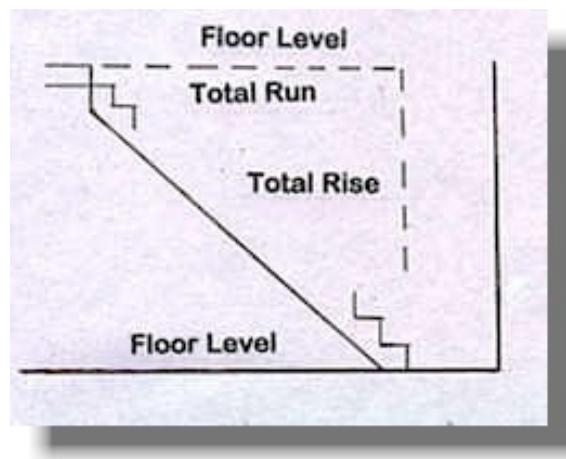
4 x clamps to suit MFS system, (FSZ 120 or FSZ-HZ 160 recommended)

1 x Workbench, (MFT 3 recommended)

PPE, (earmuffs & safety glasses)

Let's get started!

Calculate the Rise and Run of your staircase



First, to determine the number of stairs your stair case will require, you will need to determine the total Rise and Run of your staircase.

For the steps to be comfortable to use and easy to walk up, it's important that the total rise of each step does not exceed 200 mm

Divide the total rise of your staircase by 200 to determine how many steps you'll need

For the example we're using here our total rise is 600 mm which means we'll need three steps in total.

The run of our staircase is 690mm so the width of our stair treads will be approximately 230mm each.

Cut your stringers to size then transfer your measurements to each stringer as shown in Photo 1.

Be sure to clearly identify the treads and the risers on each step to avoid errors when you begin to rout out the trenches.

Remember that the tread and riser layout on the left and right hand stringers **must** mirror each other.



Once you're happy with these you'll move on to assembling the MFS for the next stage.

The MFS

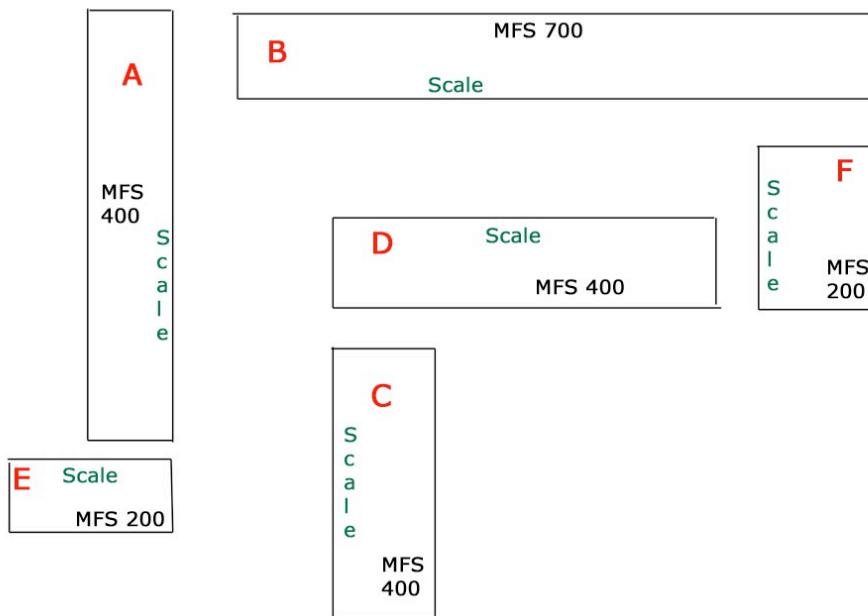
The MFS is Festool's multi angle routing template. It consists of four aluminium profiles which are connected together and can be used to perform a wide variety of functions in various materials, from routing trenches/ slots to circles to inlay work.

It's available in 2 set versions: MFS 400 set, which consists of 2 x 400mm and 2 x 200mm profiles or MFS 700 set which has 2 x 700mm

and 2 x 400mm profiles. Additional profiles in various sizes up to 2metres long are also available.

For the steps here we'll be using an MFS 400 set combined with an MFS 700 set.

The first thing you need to do is to disassemble both MFS sets and lay them out as shown in the diagram below;



We need to assemble the MFS units into an "L" shape so we can rout out the channels for the treads and risers.

The joiners on the MFS system are shown below

There are 2 pins on the end of the profile as well as a 1/2 round metal dowel with a ball bearing in its end. This is connected to a screw thread and is used to lock the sections together

dowel

pins



When connecting two sections together place the two pins in the opposing channel then insert the 1/2 round dowel with the ball bearing end in first. When fully inserted tighten the screw.



Assemble the MFS together following the steps below. Make sure that all the scales are facing toward the centre as shown in the diagram.

Don't tighten the joints at this stage as a bit of movement will make the assembly easier

Step 1, Connect Part A (MFS 400) to Part B (MFS 700)

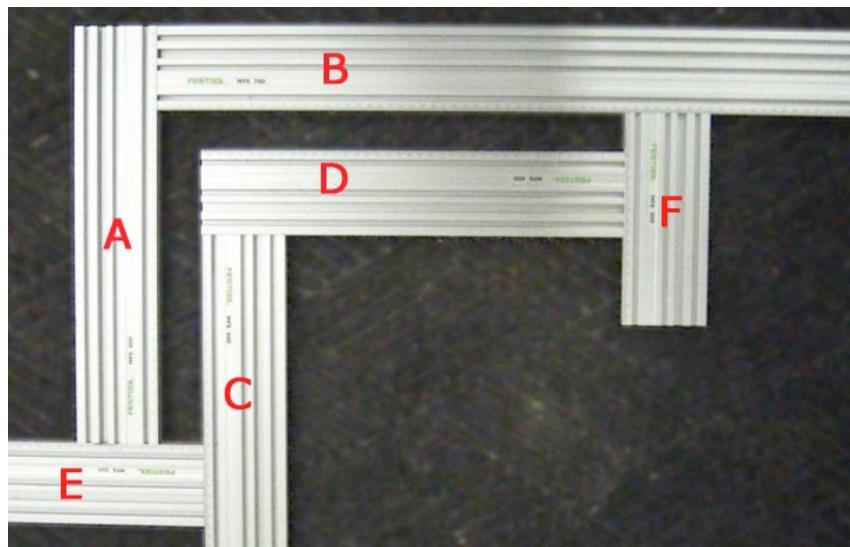
Step 2, Connect Part E, (MFS 200) to Part A, (MFS 400)

Step 3, Connect Part F, (MFS 200) to Part B (MFS 700)

Step 4 Connect Part C, (MFS 400) to Part E (MFS 200)

Step 5 Connect Part D, (MFS 400) to Part F (MFS 200)

Step 6 Connect Part C, (MFS 400) to Part D, (MFS 400)



When complete it should look something like this

Setting the Channel Widths.

Now the MFS is assembled we need to set it so that we'll rout the right width of channel to suit our treads and risers.

In this example, our treads are cut from 25mm Ply and our risers are cut from 19mm pine.

To rout out the trenches, I'm using a 12mm straight cutter in conjunction with a 30mm copy ring,



Our first step is to calculate the offset between the router cutter and the copy ring

We do this by subtracting the diameter of the cutter from the diameter of the copy ring:

Copy Ring	30mm
Cutter	<u>12 mm</u>
Offset	18mm

We now add the offset to the thickness of the material to calculate the settings for the MFS

Tread	25mm
Offset	<u>18mm</u>
Width	43mm

On our workpiece the space between parts A and C corresponds to the tread width and the space between parts B and D correspond to the riser width

This means that the scale at the intersection of parts A and C needs to be set to 43mm

Now we'll work out the width of the riser channel:

Riser	19mm
Offset	<u>18mm</u>
Width	37mm

The scale at the intersection of parts B and F now need to be set at 37mm.

To check your calculations, the difference between the thicknesses of the tread and riser materials should be the same as the difference between the two settings on the MFS.

Clamp your first stringer on the workbench and place the MFS on it so the tread and riser channels correspond correctly.

Centre the MFS so there is approx 9mm between the pencil lines and the edge of the MFS unit.

Clamp the MFS to the Stringer then slide one of the L brackets into the channels on the underside of the MFS on each side of the stringer, and tighten them so they are snug and parallel to the stringer.



Place the copy ring and cutter into the router and set to the depth you require.

Place the router on the MFS do a test plunge, (not under power) to check the set up.

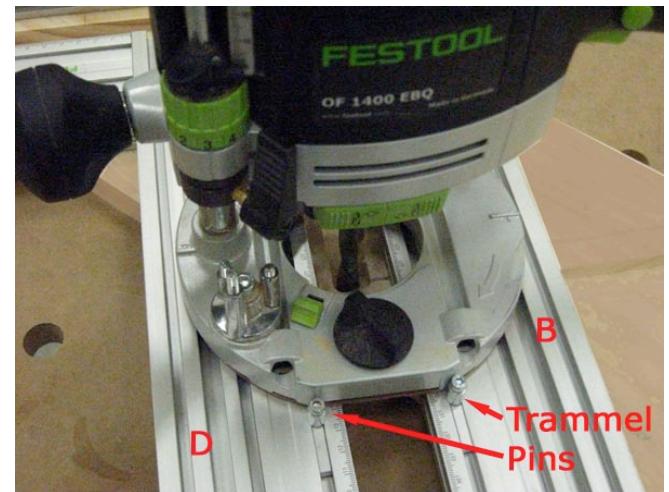
Loosen the screws on the MFS and slide parts A & E up part C to set the length of cut for the tread. The distance from the end of the layout line of the tread, to part E should be 9mm, (the offset distance)



To set the length of cut of the riser, use the trammel pins that come with the MFS as stops to limit the travel of the router



Plunge the router so the tip of the cutter stops just before the pencil line that defines the front edge of the riser then slide a trammel pin into one of the channels on the face of the MFS and lock them against the base of the router.



Connect the power and dust extraction to your router then cup the 1st pass on the 1st tread and riser

Repeat and cut the tread and riser channels to the correct depth



The beauty of the MFS system is that once you've cut your first set of tread and riser channels, you can simply slide the MFK along the stringer using the L brackets as guides

Once in place no further set up is required – just clamp it in place then cut the next set of channels

Repeat the process until you've cut all the trenches on the first stringer



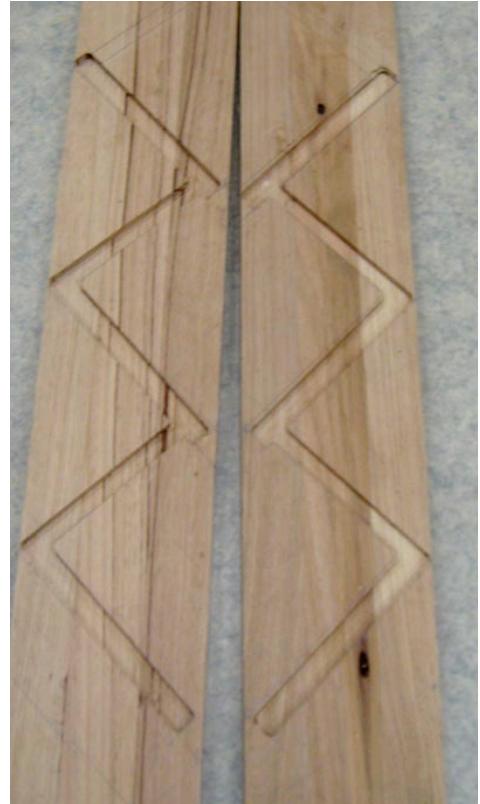
When the first stringer is complete, place the 2nd stringer on the workbench and line up the MFS.

You'll find that the treads and riser trenches don't line up. This is because our risers are mirror images of each other. The simplest way to set up the MFS to cut the 2nd stringer is to simply remove the L brackets and trammel pins from the MFS and turn the unit over.

So, if the product names and scales are facing upwards for the first stringer, they'll be facing down for the second one.

Once you've done this, reattach the L brackets and Trammel pins as detailed above, and line up, clamp and rout out the second stringer.

When finished, your stair stringers should look like this



To fit your treads into the trenches you'll need to use the 12mm bearing guided cutter to round over the front edge of each tread.

If you prefer the steps to have square edges used a chisel to square up the rounded corners.

When this is done begin to assemble the steps

Place one stringer on the workbench and fit the treads and risers. Then Place the 2nd stringer on top

When you're happy with the fit, disassemble, then glue & screw the steps





The finished product!!!!!!