

Cross-cutting on a tablesaw can be done safely as [Michael T Collins](#) explains

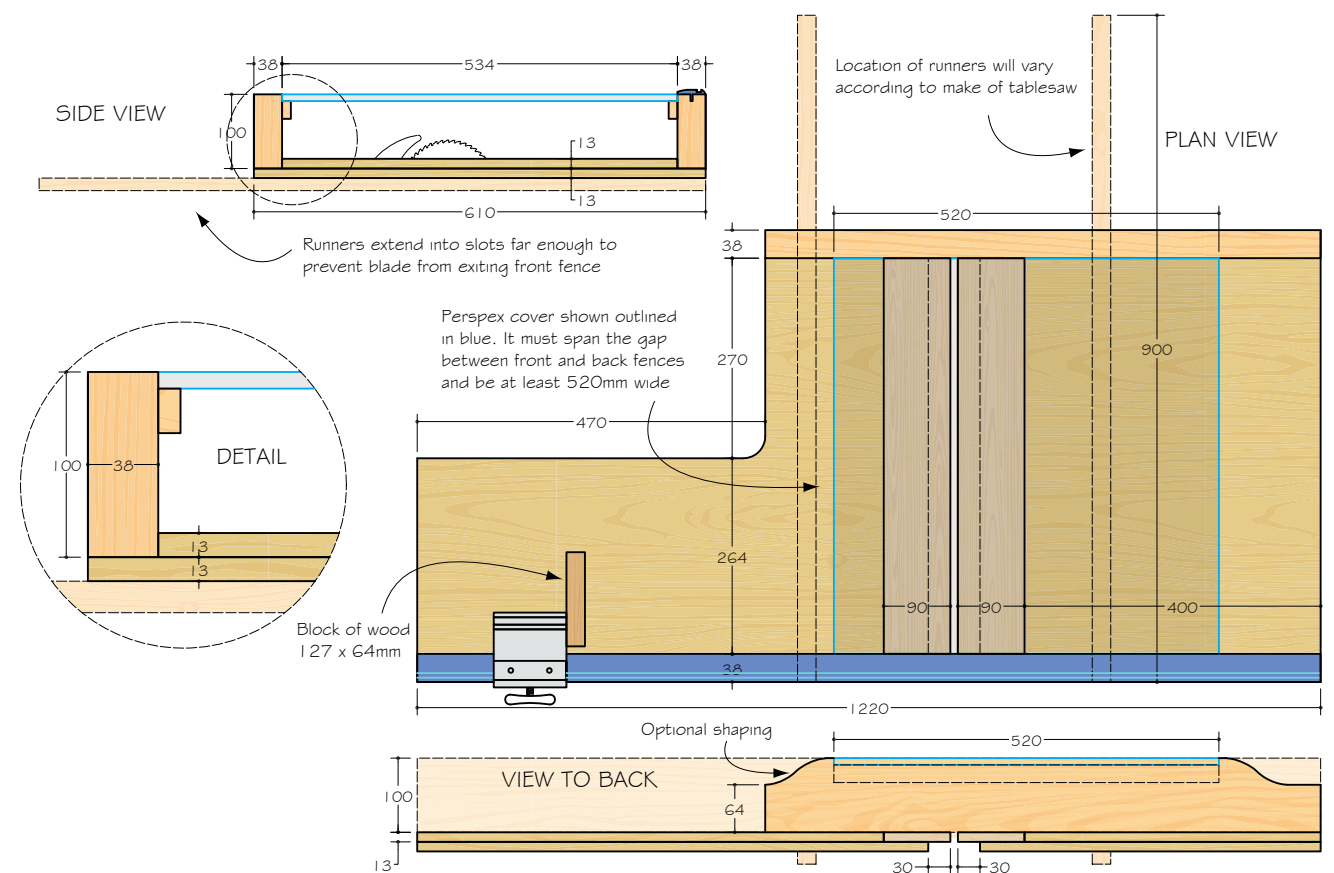
You could use a sliding mitre saw, which is great for cutting lengths but limited by the width that can be cut. In the past I've overcome this challenge by rotating the board and matching the saw cuts. Invariably, they never quite match and creates additional work by having to clean up the ugly 'saw step' with a plane. You could hand saw them, again producing a rough edge, but this is also time consuming.

I have used several designs in my woodworking career and all have included some sort of additional safety.

- 2 pieces 1220 x 610 x 13mm ply
- 2 pieces 1220 x 100 x 19mm ply
- 2 pieces 750 x 100 x 19mm ply
- Material for runners
- 534 x 520 x 9mm Perspex

2 Next we need to make the front and back fences. To do this, laminate two pieces of 750 x 100 x 19mm to form the back fence and two pieces of 1220 x 100 x 19mm to form the front fence. Clamp the laminates, making sure they remain straight and set aside to dry.

6 Then place the 1220 x 610 x 13mm piece of ply on to runners with the right-hand edge hard up against the fence and the front of the base at the front edge of the table. Press down firmly. ➤



7 Remove the base and drill about four pilot holes down the length of the runner, counter sink and secure in place with screws.

Back to the fences

8 Shape the back fence and add a quarter round profile.

9 Align the back fence with the back edge of the base and secure with counter-sunk screws every 150mm or so, but avoid the area 60mm to the left of the blade. The front fence will carry the track. The track I used had a mounting flange that needed to be housed.

10 To do this I used a circular saw to cut a 3mm slot to a depth of 20mm. The spirit level in the image gives me somewhere to rest the saw and keeps the fence straight as I make the cut.

11 I also added a 45° chamfer on one side of the slot so that the track seated fully.

12 Drill holes through the fence and flange of the track secure in place with screws driven through the wood and the track.

Attaching the front fence

The front fence must be attached so that it is as close as possible, at 90° to the blade – we will fine tune later.

13 First secure the right end of the fence in the desired location, flush to the front of the base. This will be our pivot point.

14 Then with an accurate carpenter's square against the blade (make sure you are resting on the face of the blade and not skewed on the teeth), position the other end so that the angle between the fence and the blade is 90°.

15 With a screw, secure the fence in place on the left-hand end. This will be our adjustment screw.

Zero clearance inserts

Over the course of a project, I might change the blade a couple of times using a standard 3mm rip blade, cross-cut blade or even cut long mitres – doing so on this sled would immediately lose its zero-clearance. So this sled will have replaceable inserts. Position the sled over the blade and carefully raise it so that it just touches the underside of the sled.



16 Now, turn the sled over and remove a section of the base 30mm either side of the kerf mark just created. The blade will now be in the middle of a 60mm gap in the base. Cut a second piece of 13mm ply to about 3mm less than the distance between the two fences. This will form the second layer of the base.

17 Cut this sheet into two pieces so that it creates a ledge about 60mm either side of the blade. This is where the insert will lay. Secure these two boards in place with countersunk screws.

18 Insert a piece of the offcut 13mm board, this will be the zero-clearance insert.

19 Drill through both the inserted board and the base using an 8mm drill.

20 Remove the insert and re-drill the base holes using a 9.5mm drill. Now secure the threaded inserts into the baseboard.

21 Countersink the insert holes and secure to the base using the machine screws.

The guard

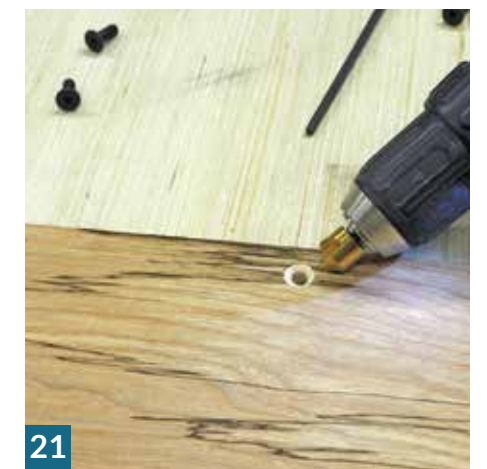
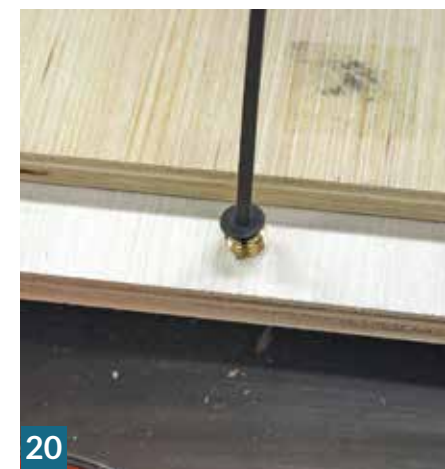
The vast majority of cross-cut sleds being used have no blade guard and some do not even keep the riving knife in place. However, on this sled the two fences support a Perspex guard that spans the gap.

22 I pin nailed, then screwed a ledge to the front and back fence and cut the Perspex to length and screwed it to the back fence. The front fence needs to be adjusted before finally securing the guard.

Fine tuning

Unless you are remarkably lucky, the fence will not be at 90° to the blade, and some fine tuning is required. To do this I will be using William Ng's simple 5-cut method.

23 Take any four-sided board that is at least 300 x 300mm and label the sides 1 through 4 and also label side 1 with a 5. With the board firmly held against the front fence, cut a sliver off side 1, rotate the board clockwise and cut a sliver off side 2 – repeat the cut/rotate until you are back at side 5. ▶





Then cut a 30mm piece off side 5 – label the top A and bottom B. Any angle error between the blade and fence has now been compounded four times.

24 Accurately measure the width of the piece at A and B.

Formula

The error = $(A-B) \div 4$ (the no. of cuts) \div length of 5th cut (this gives the error per inch) \times distance between pivot point and the point of adjustment.

So the error = -0.0639in

Therefore, the left-hand end of the fence needs to move out by approximately 0.0639in making the angle greater.

Take a feeler gauge and select the closest gauge to the error you found above, in my case 0.064in (slightly larger than $\frac{1}{16}$ in)

Place a piece of wood securely on the base and resting against the fence at the location of the left adjustment screw. Now, remove the screw that was holding the left end of the fence in place.



25 Insert the feeler gauge between the block of wood and the fence and reposition the fence against the feeler gauge. Screw the fence in place using a new hole. You have now moved the fence out by the 0.064", thus increasing the angle at the blade.

26 Repeat the process of cutting a board and testing for square. You should now have a cross-cut sled that cuts perfect right angles to the blade. Note: If you get a positive result the fence needs to be moved in – place the feeler gauge between the fence and the block, loosen the adjustment screw and move it forward the thickness of the feeler gauge.

Finally, secure the front fence in place again, avoiding the area within 60mm

to the left of the saw cut. This is so that you can cut 45° mitre on this sled.

The stop

27 Secure a self-adhesive measuring tape to the track so that the zero is exactly on the left of the saw kerf. Now, cut a piece of wood to an accurate length, say 300mm.

28 I cut a lot of thin pieces and because of the height of the fence I needed to add a block of wood to the stop to prevent the wood sliding under. Take the board you have just cut and place it against the blade. Position the stop against the other end and adjust the cross hair so that it is directly above the 300mm mark and secure in place.

29 Now cut a piece of wood on the sled, measuring should confirm that the sled is now ready to make accurate, repeatable 90° cuts.

30 To reduce the mass of this sled I cut a section out of the base. You can also see the reason for the extra-long runners, they hit the end of the mitre slot in the outfeed table and thus prevents blade emerging out the front. If you do not have this option, you must add a few blocks of wood to the front of the fence.

There are lots of options but using the sled without a guard is not one of them! ■