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# **LIGHTBLOCKS**

Seamless Lightblocks glue joining  
guide

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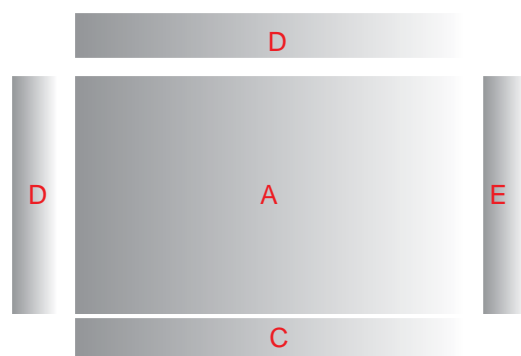
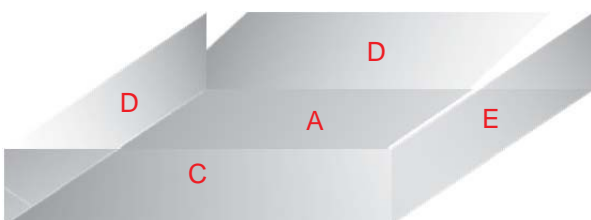
## LIGHTBLOCKS JOINS

### Required tools

1. Lightblocks Kit (see box)
2. CNC 2½ Axis Flatbed Routing Machine (Minimum bed size: 2440x1220mm)
3. Panel (Table) Saw
4. 45° CNC router cutting tool (Sharp)
5. Flat knife blades (Sharp)
6. Oscillating Random Orbital Sander
7. 80 Grit Sandpaper discs
8. Router/Trimmer
9. Router/Trimmer Cutters: 3mm and 5mm round
10. Isopropyl Alcohol
11. Clean Cotton Cloths
12. Tape Dispenser
13. 50mm Plastic Packaging Tape
14. Dremel
15. Dremel Tungsten Carbide Cutter (3.2mm)
16. Latex Gloves
17. Dust Mask
18. Safety Glasses

### Lightblocks fabrication kit

- Tenacious Tape
- Weld-on Adhesive
- Adhesive Applicator Gun
- Table Chocks
- Plastic Wipers
- Right Angles
- Resin Coat
- Lightblocks Samples



## cutting

1. Cut mitre on CNC router using the 45° cutting tool. It is imperative that the tool is sharpened regularly to ensure a clean cut.
2. Ensure adjoining mitres (or butt joins) are cut from same area on sheet to ensure a uniform thickness.
3. Cutting speed should be at a rate of 2500mm/minute, minimum 18000rpm.
4. Make sure the final cut only takes off a maximum of 1mm and leaves a clean cut.
5. Ensure mitred face is smooth and dust free, and that the sharp mitred edge is clean and shatter free – run a sharp flat knife blade along the surface of the mitre to remove any lipping that may occur on the mitre edge (see Figure 1).



figure 1

## gluing preparation

1. Follow steps 2 - 6 only if project requires a clean (glue free) inner surface, or specifies a Mirror/Metallic colour. If not, proceed to step 7.
2. Pull protective paper back approximately 30mm from internal edges to expose Lightblocks backing (see figure 2)
3. Run a strip of Tenacious Tape along the top edge of the Lightblocks backing, leaving 5-10mm hanging over the mitre edge (see figure 3).
4. Firmly run Plastic Wiper along tape to prevent air bubbles along edge of mitre (see figure 4).
5. Remove the excess Tenacious Tape by running a sharp, flat knife blade along the mitre edge (see figure 5). Ensure tape is free of tears on the mitre edge and does not stick to mitre face, leaving a residue.
6. Run a sharp blade along the taped edge, on a 25° angle, to remove any remaining tape from the mitre surface (see figure 6).
7. Repeat Steps 2 - 5 for each mitred edge.

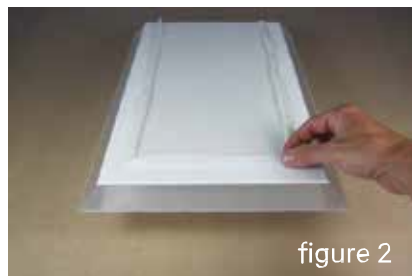


figure 2

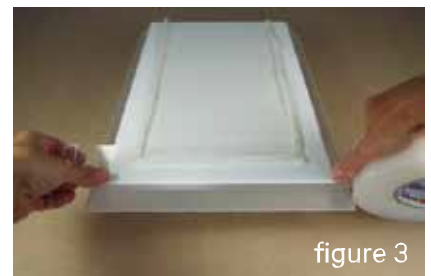


figure 3

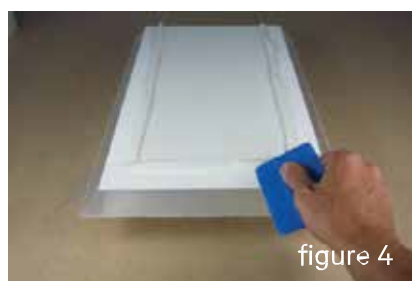
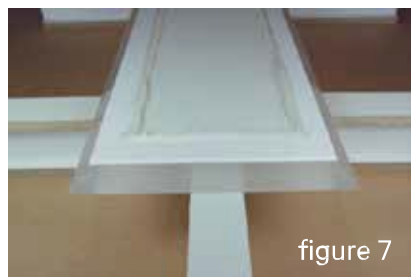
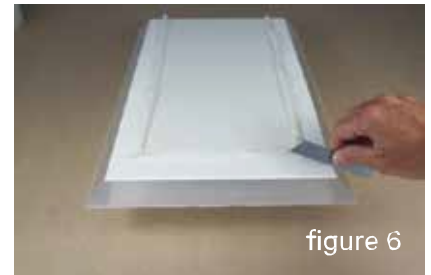


figure 4

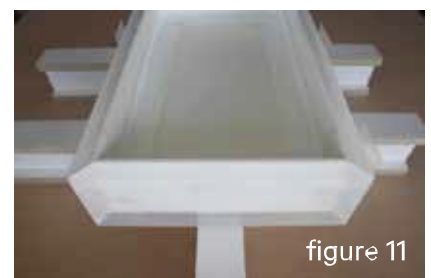


figure 5

8. Set up support chocks on a flat, level surface in preparation for supporting Lightblocks components.
9. Place component **A** of the Lightblocks box in the centre of support chocks, exposing mitre surfaces (see figure 7).
10. Cut Tenacious Tape into lengths of approximately 200mm.
11. Place tape pieces on the underside of the bottom piece 2mm in from each mitred corner, leaving half of the length of tape exposed (see figure 8). Ensure tape is bubble and crease free along adjoining edge.
12. Place remaining tape pieces along mitred edges at approx. 150mm intervals
13. Adjust support chocks so they are evenly spaced between tape pieces.
14. Place component **B** in correct position on support chocks (see figure 9). Ensure adjoining component is tight up against the edge of component **A**, and mitres are lined up correctly.
15. Firmly fix exposed tape to adjoining side component **B** (see figure 10). Side component should be able to stay in correct joining position without being held in place. (see **Troubleshooting** if component is not standing independently).
16. Repeat steps 13 -14 for each remaining Lightblocks box component.



17. Dry fit to ensure box is square (see figure 11).



## Gluing

1. Following safety instructions on adhesive cartridge, insert cartridge into applicator gun.

2. Remove cartridge cap/retainer ring (DO NOT discard) then trigger gun until material is dispensing slightly from both openings (DO NOT allow material to touch).

3. Attach mixing nozzle and secure in place with cartridge cap.

4. Dispense a small bead, to waste, to ensure proper mixing.

5. Ensure all surfaces are free of dust by blowing with compressed air (see figure 12).

6. Clean mitre surfaces with

Isopropyl Alcohol added to a clean cotton cloth, ensuring joints are completely free of dust and dirt (see figure 13).

7. Raise adjoining component **B** halfway and then apply adhesive evenly along the bottom edge of the mitre joint (see figure 14). When dispensing, only pull trigger back half way to avoid excessive bubbles. (Adhesive amount: approx.  $\frac{1}{4}$  of the height of the joint). If many bubbles are present in joint, raise and lower component **B** to move bubbles to top.

8. Slowly raise component **B** into position (see figure 15).

9. Repeat step 7 with component **C**.

10. Liberally apply adhesive to the vertical mitre joint as component **C** is slowly raised into position (see figure 16).

11. Whilst holding components in position, firmly tape together the vertical joint starting from the top (see figure 17).

12. Repeat steps 7 – 11 with remaining components **D & E**. **NB**. If during the gluing process there are an excessive number

of bubbles or blemishes, in the adhesive, present in the joint, see

***Troubleshooting.***



figure 12



figure 13



figure 14



figure 15

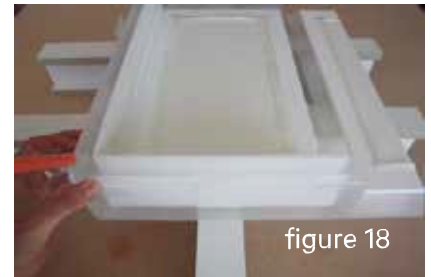


figure 16



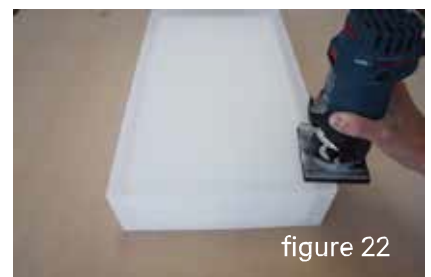
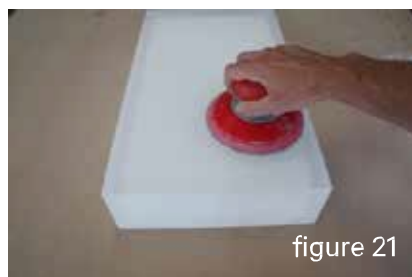
figure 17

13. Top-up vertical joints with remaining adhesive, if shrinkage of adhesive in the joint occurs (see figure 18). Apply more tape if necessary.
14. If a bubble develops gently massage components at the joint, with your index finger and thumb, forcing the bubble out of the joint in the direction that the bubble is flowing. Then firmly apply tape over area in the same direction to prevent the bubble from retreating back into joint.
15. Check for bubbles every few minutes until adhesive has hardened. Adhesive will harden after approx. 35mins @ 22° C.



## clean-up & finishing

1. Follow steps 2 – 3 only if project requires a clean (glue free) inner surface. If not, proceed to step 4. Lightblocks Mirror/Metallic colours always require a clean surface.
4. Allow Lightblocks box to sit for a minimum of 4 hours before moving.
5. Using a Random Orbital Sander, with an 80 grit Sandpaper, thoroughly sand to remove adhesive leakage (see figure 21).
6. Using a Router/Trimmer, trim edges as per specification (see figure 22). Ensure Cutter is sharp, and the trimming speed is slow and steady to avoid chattering.
2. Before adhesive hardens completely (adhesive will harden after approx. 35mins @ 22° C), using a sharp, flat chisel, remove the excess adhesive from the inside edge of Lightblocks Box by running the chisel under hardening adhesive (see figure19).
3. Remove protective paper (see figure 20). Do not remove protective paper and tape for Lightblocks Metallic colours.
4. Allow Lightblocks box to sit for a minimum of 4 hours before moving.
5. Using a Random Orbital Sander, with an 80 grit Sandpaper, thoroughly sand to remove adhesive leakage (see figure 21).
6. Using a Router/Trimmer, trim edges as per specification (see figure 22). Ensure Cutter is sharp, and the trimming speed is slow and steady to avoid chattering.



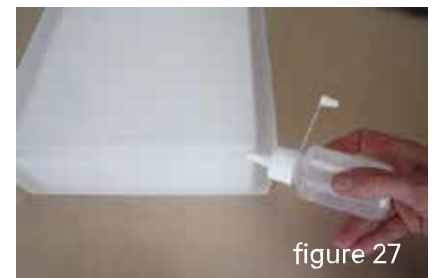
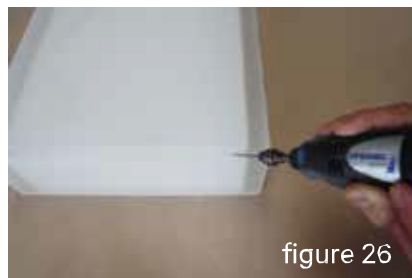
7. Lightly sand edge detail using either a Random Orbital Sander with 80 grit sandpaper, on low speed, or a sanding block (see figure 23). Ensure that the edge detail is not distorted when sanding.
8. Apply Resin Coat with a clean cotton cloth, ensuring that all exposed surfaces are covered (see figure 24). For re-use, store cloth in sealed container after use.
9. Using a clean, dry cotton cloth, rub surfaces in a circular motion until all exposed surfaces are evenly coated and free of smudging.
10. Allow Resin Coat to dry completely before packing. (Drying time approx. 1 hour at 25 °C).



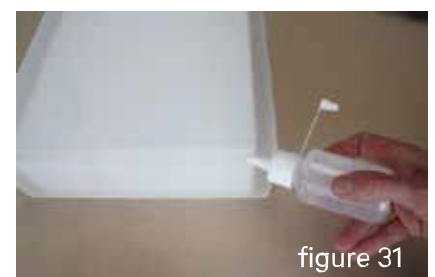
## Trouble shooting

### REMOVING BUBBLES

1. If excessive bubbles occur (4 small bubbles per lineal metre are acceptable in the invisible joints) follow steps 2 – 5.
2. Using a Dremel, with a Tungsten Carbide Cutter (3.2mm) attached, slowly cut, on a medium/high speed, from the outer edge at a 45° angle, in line with the bubble you wish to remove (see figure 26). The first cut should be approx. 1 cm along edge, then slowly taper towards bubble until it has been completely removed.
3. Pour water into cavity (see figure 27) to prevent cutter from overheating and cracking glue line.
4. Using the Dremel, on a medium/high speed, lightly guide cutter around the inside of the cavity to clean out remaining Lightblocks swarf (see figure 28).
5. Using a compressed air gun, blow out any remaining residue (see figure 29).



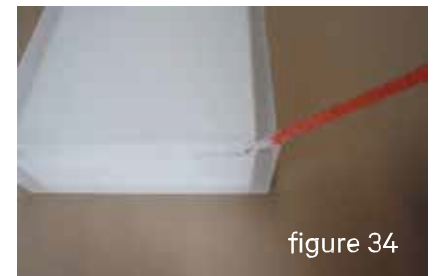
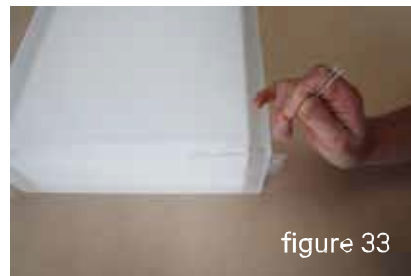
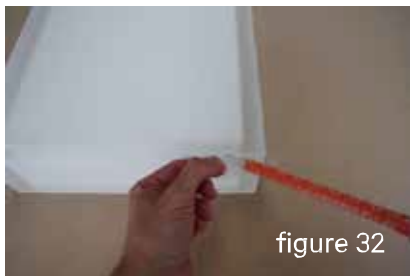
6. Firmly apply a strip of Tenacious Tape along bottom of cavity leaving a 1cm wall above the cavity (see figure 30).
7. Firmly run your thumb along the tape, below the bottom edge of the cavity to ensure that no adhesive will leak through the tape (see figure 31).





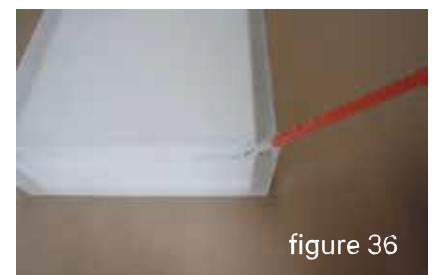
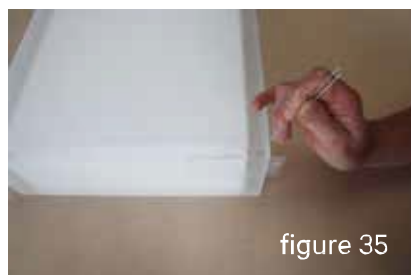
8. Attach new mixing nozzle onto adhesive cartridge and secure in place with cartridge cap.
9. Dispose of a small amount of adhesive until nozzle is free of bubbles.
10. When applying adhesive to cavity, hold tip of nozzle on the tape wall and slowly allow adhesive to flow into the bottom of cavity, ensuring that no air bubbles develop (see figure 32).
11. If cavity is over 5mm deep, only fill to a maximum of 5mm. Let adhesive harden before topping up cavity (adhesive will harden after approx. 35mins @ 22° C).
12. To prevent the adhesive shrinking into cavity as it hardens, ensure to over-fill.
13. If any bubbles remain in cavity, using a paper clip, scrape bubbles out of cavity (see figure 33).
14. Top up adhesive along top of cavity (see figure 34).

Repeat steps 5 – 10 of **Clean-up & Finishing**.



## OVERSIZE COMPONENTS

1. If component is not standing in correct joining position independently, follow steps 2 – 4.
2. Prior to gluing, clamp two (one at each end) Right Angles to base component (see figure 35). Ensure Right Angle is in correct position by holding adjoining side component into place.
3. After adhesive has been applied to joint, lightly fix a second clamp to side component and vertical of the Right Angle (see figure 36). Do not over-tighten clamp as this may put too much pressure on joint. Alternatively, the vertical can be secured to the Right Angle with a strip of Tenacious Tape.
4. Leave clamps in place until adhesive hardens.



**BLEMISHES OR EXCESSIVE BUBBLES IN ADHESIVE**

**GLUE WET**

1. If during the gluing process there are an excessive number of bubbles or blemishes in the adhesive present in the joint, you may open the joint and apply more adhesive to wet adhesive (only possible within 5 minutes of applying adhesive).

**GLUE TACKY**

After this time, if the adhesive has become tacky, apply Paint Thinners liberally to joint, and thoroughly wipe off adhesive with a clean cotton cloth. Ensure joint is entirely clean of adhesive before re-applying.

2. Repeat gluing process.

**INTERNAL CORNERS**

1. Cut 45° internal corner components on a CNC Router using a sharp straight tool, for the butt joint and 45° cutting tool, for dropdown mitres (see figure 37). Ensure to cut components over-size in length (this will be cut to size on Panel Saw later in the process).

To ensure a consistent thickness for adjoining components cut from same area of Lightblocks sheet.

2. Dry fit 45° butt joint and apply a strip of Tenacious Tape along the joint, on the top of Lightblocks backing. Remove tape from joint with a sharp blade (see figure 38 | 39 | 40).

3. Follow **Gluing** instructions to fix dropdowns. Ensure that the dropdown is over-lapping adjoining component on each edge (see figure 41 | 42).

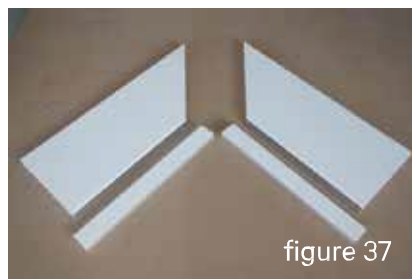


figure 37

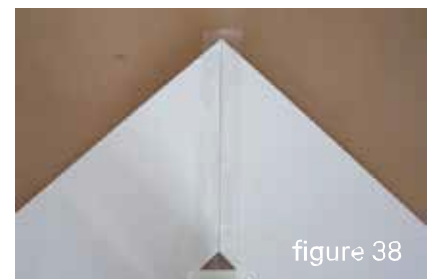


figure 38

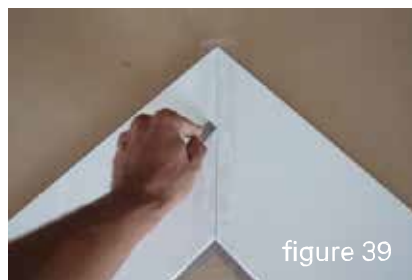


figure 39

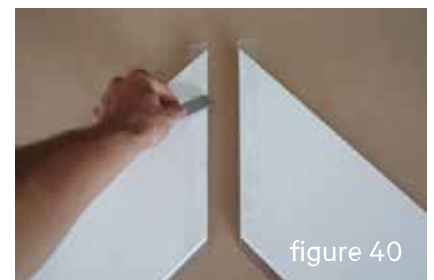


figure 40



figure 41

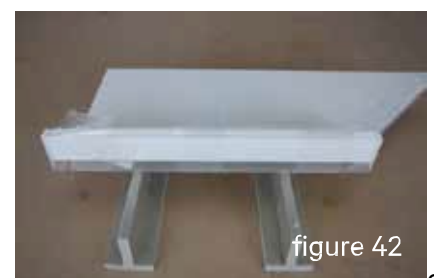


figure 42

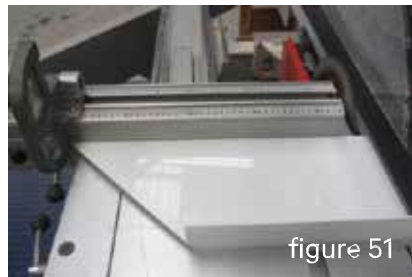
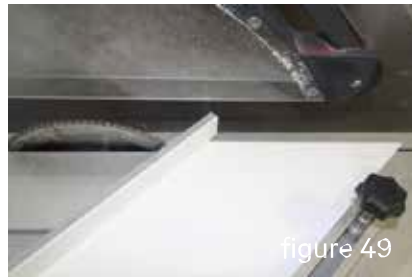
4. Allow joined components to sit for a minimum of 4 hours before moving.
5. Remove tape from the top surfaces of joined Lightblocks components. Using a Random Orbital Sander, with an 80 grit Sandpaper, thoroughly sand to remove adhesive leakage (see figure 43).
6. Using a Router/Trimmer, trim top and bottom edges as per specification (see figure 44 | 45).  
Ensure Cutter is sharp, and the trimming speed is slow and steady to avoid chattering.



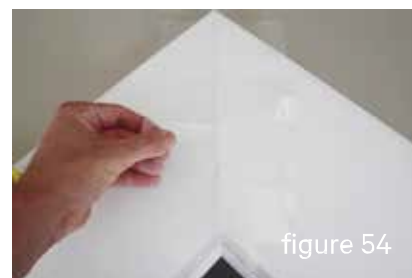
7. Lightly sand top and bottom edge details using either a Random Orbital Sander with 80 grit sandpaper, on low speed, or a sanding block (see figure 46 | 47). Ensure that the edge detail is not distorted when sanding.
8. Set up panel saw cross slide to cut a 45° angle cut with saw blade at 0° (see figure 48).
9. When cutting back over-lapping dropdown, remove a few millimetres of the Lightblocks top to ensure a straight cut for the butt joint. Make sure the final cut only takes off a maximum of 1mm to ensure a clean cut.



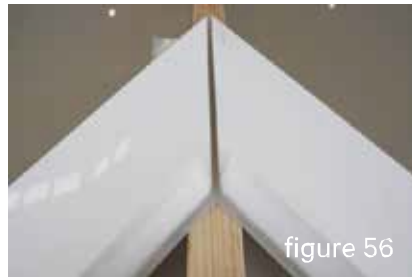
10. Adjust cross slide to opposite 45° angle
11. Repeat step 9 with adjoining corner component (see figure 50).
12. Set up cross slider to cut a straight (90°) cut, to specified length (see figure 51). Make sure the final cut only takes off a maximum of 1mm to ensure a clean cut.
13. Repeat step 12 with adjoining corner component (see figure 52).



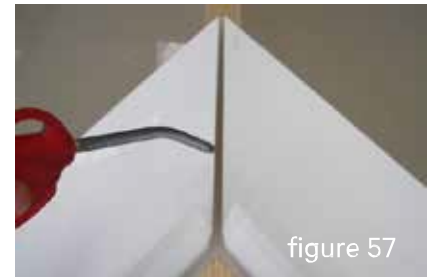
14. On a flat, level work surface, dry fit butt joint with the top surface facing up. While holding adjoining components tightly together, firmly apply a strip of Tenacious Tape along join to create a hinge (see figure 53).
15. Firmly apply 150mm lengths of Tenacious tape across join to strengthen hinge (see figure 54).
16. Carefully flip components over so that the top surface of Lightblocks Internal Corner is lying flat on the work surface.
17. Apply Tenacious Tape to dropdown face along edge of vertical joint (see figure 55). This will prevent adhesive from sticking to dropdown surface.



18. Place a length of 4x2 timber (or something of similar dimensions) under the length of the joint (see figure 56). This will open up the joint to allow for adhesive application.



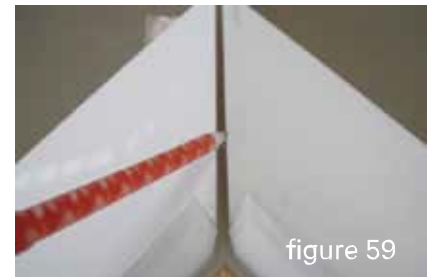
19. Ensure all surfaces are free of dust by blowing with compressed air (see figure 57).



20. Clean mitre surfaces with Isopropyl Alcohol added to a clean cotton cloth, ensuring joints are completely free of dust and dirt (see figure 58).



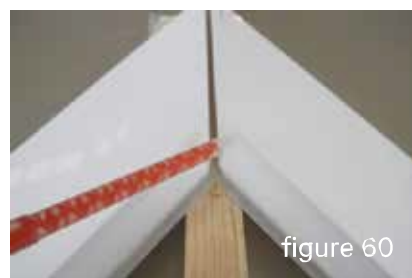
21. Follow steps 1-4 in ***Gluing*** for nozzle application.



22. Starting from external corner, apply adhesive along the joint (see figure 59). Ensure that the adhesive reaches the tape line at the bottom of the joint.

23. Apply adhesive to both sides of vertical joint (see figure 60).

24. Pull chock out from underneath joint and slowly lower components down to work surface while continuing to apply adhesive to verticals (see figure 61).



25. Firmly apply 150mm lengths of Tenacious Tape across joint while pressing adjoining components together (see figure 62).



26. Firmly apply tape to behind vertical joint to prevent adhesive leakage (see figure 63).

27. Allow joined components to sit for a minimum of 4 hours before moving.

28. Follow steps in ***Clean-up & Finishing***.

