

Application Note - End-Plate Port Tubing and Flow Field Alignment Tubing Preparation

These instructions describe preparation of the port tubing pieces for cell fixtures with blue end-plates as well as tubing pieces that are the flow field alignment pins for all cell fixtures.

A. Materials Required

1. Clean, sharp knife (X-Acto knife) or razor blade
2. A metric ruler
3. Teflon FEP tubing, 3 mm OD for flow field **alignment pins** – Scribner part number (p/n) 1809, McMaster-Carr p/n 5557K37
4. Teflon FEP tubing, 3/16 in. OD for **25 cm² ports** – Scribner p/n 1819, Cole-Parmer p/n K-06406-64, McMaster-Carr p/n 52355K41
5. Teflon FEP tubing, 1/8 in. OD for **5 cm² ports** – Scribner p/n 1820, Cole-Parmer p/n EW-06406-62, McMaster-Carr p/n 52355K12
6. Small rubber mallet (recommended)

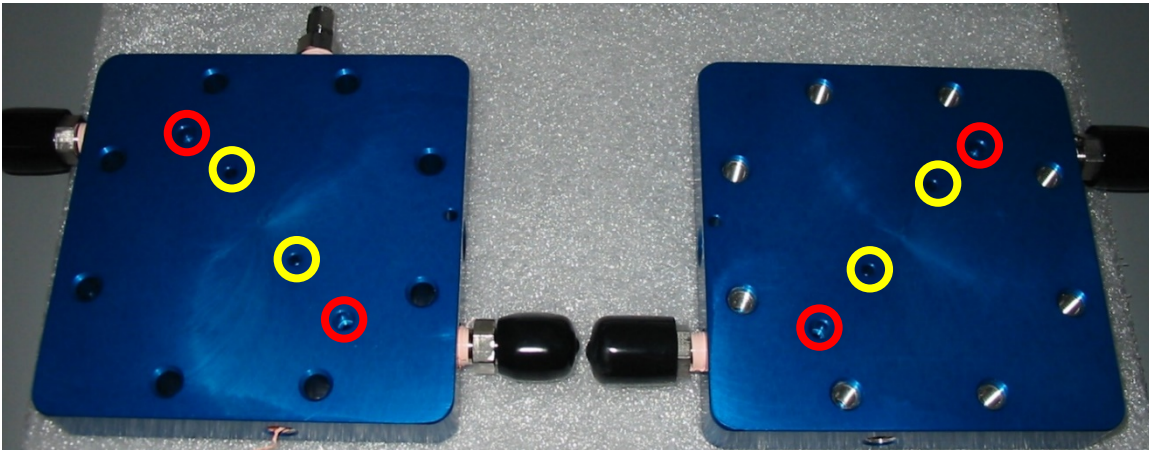


Figure 1. Detail of Scribner Associates' dual-size fixture end-plates designed for gases or non-corrosive fuels. Ports for 5 (yellow) and 25 (red) cm² cells are shown. Inactive gas ports must be sealed with short tube pieces (7 mm each) and o-rings. Active gas ports must have longer tube pieces (10 mm each) and o-rings.

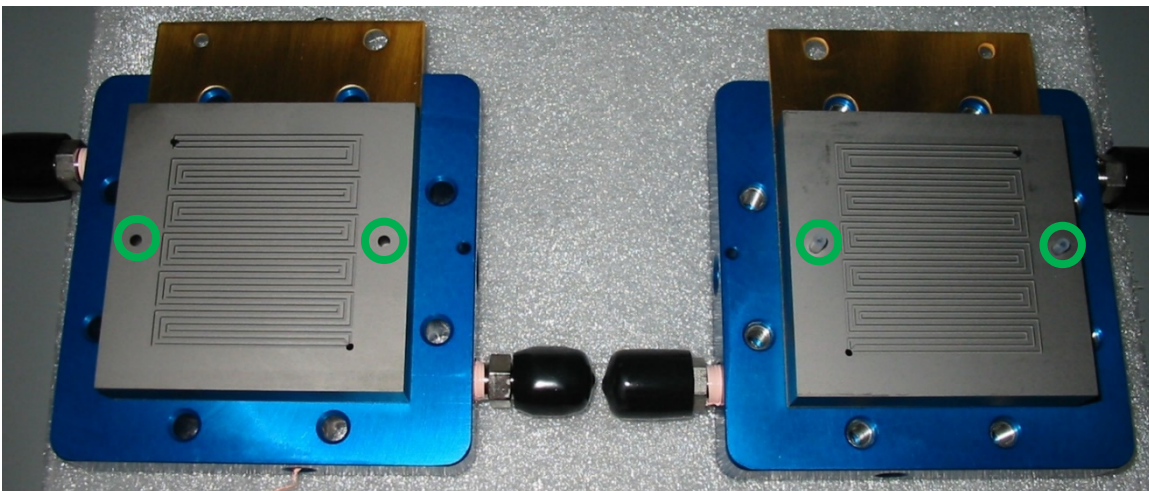


Figure 2. Detail of Scribner Associates flow fields. The green circles highlight the alignment pin tubing positions.

B. Tubing Preparation Procedure

1. On a clean work surface, place tubing next to ruler and cut to appropriate length with a clean, sharp knife.
2. For a cell with 5 cm² flow fields
 - i. Cut 4 pieces of the 1/8 in. (OD) tubing, each 10 mm length. See Figure 3. Place these pieces in the yellow positions shown in Figure 1.
 - ii. Cut 4 pieces of the 3/16 in. (OD) tubing, each 7 mm length. See Figure 4. Place these pieces in the red positions shown in Figure 1.
 - iii. It might be necessary to gently tap the tubing pieces into the port of the end-plates by using a rubber mallet. Because the thickness of the tubing varies, the tubing pieces will not always slide easily into the port positions.

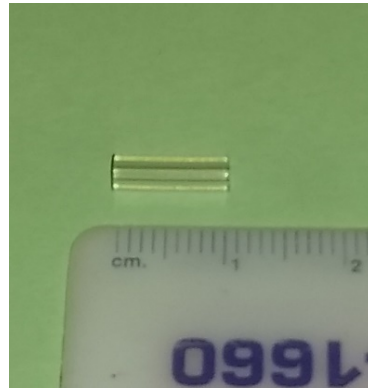
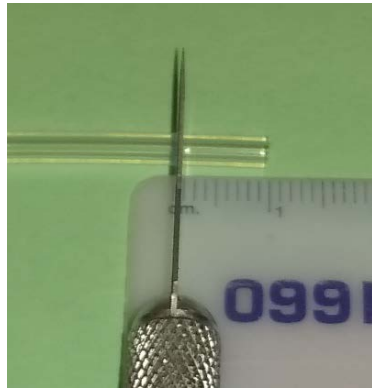


Figure 3. Preparation of 5 cm² active port tubing (1/8 in. OD).

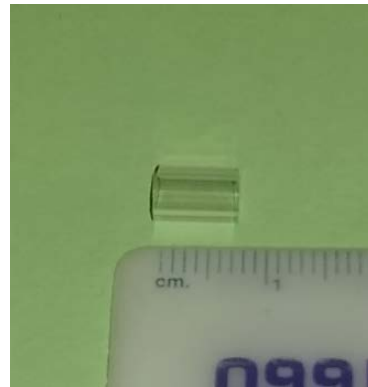
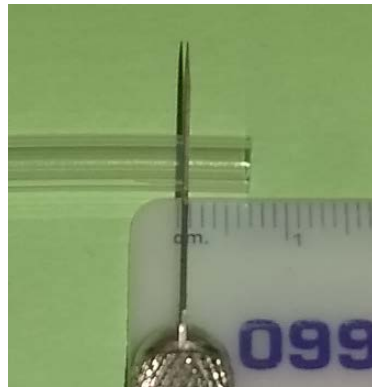


Figure 4. Preparation of 5 cm² inactive port tubing (3/16 in. OD).

3. For a cell with 25 cm² flow fields
 - i. Cut 4 pieces of the 3/16 in. (OD) tubing, each 10 mm length. See Figure 5. Place these pieces in the red positions shown in Figure 1.
 - ii. Cut 4 pieces of the 1/8 in. (OD) tubing, each 7 mm length. See Figure 6. Place these pieces in the yellow positions shown in Figure 1.
 - iii. It might be necessary to gently tap the tubing pieces into the port of the end plates by using a rubber mallet. Because the thickness of the tubing varies, the tubing pieces will not always slide easily into the port positions.

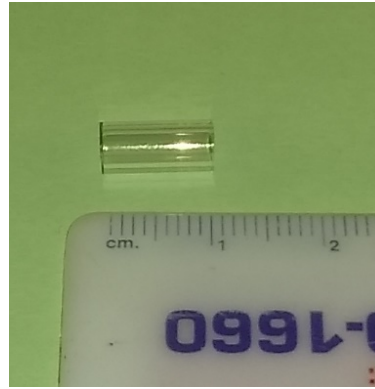
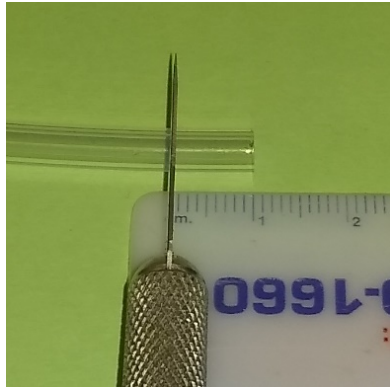


Figure 5. Preparation of 25 cm² active port tubing (3/16 in. OD).

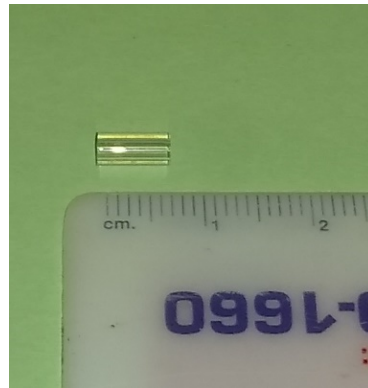
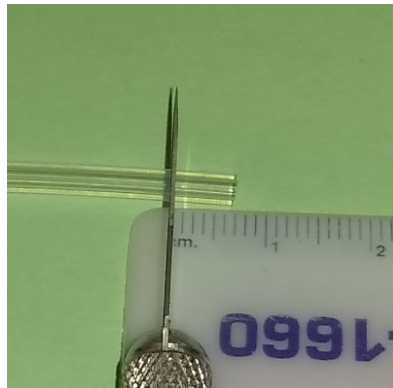


Figure 6. Preparation of 25 cm² inactive port tubing (1/8 in. OD).

4. For flow field alignment pin tubing
 - i. Cut 2 pieces of the 3 mm OD tubing, each 10 mm length. See Figure 7. Place these pieces in the green positions shown in Figure 2.
 - ii. If the cell build includes Teflon flow frames (only used with red/liquid end plates), the alignment pin tubing pieces will have to be cut to about 15 mm length each. See Figure 8.
 - iii. Do not use a rubber mallet on the alignment pin tubing – they should be slightly loose when in position. Do not risk damaging the flow fields!

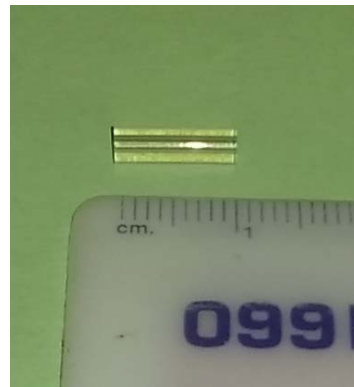
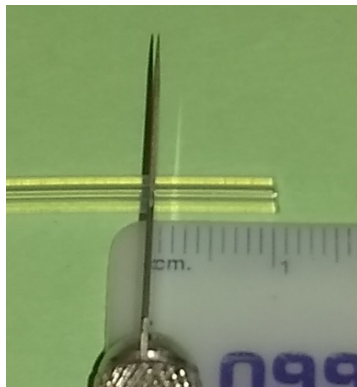


Figure 7. Preparation of 3 mm OD alignment pin tubing for general use.

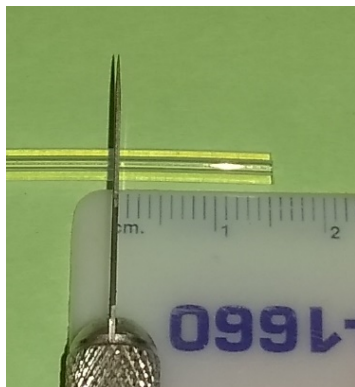


Figure 8. Preparation of 3 mm OD alignment pin tubing for use with a cell that incorporates flow frames.