PicoClear Union Use and Care

Please read these instructions carefully before using the PicoClear union. Plumbing the PicoClear union employs a slightly different technique for proper plumbing. Incorrectly tightening the union without fused-silica tubing can damage and/or destroy the clear insert.

FOR USE WITH 360 µm OD FUSED-SILICA TUBING ONLY.

Component Check List:

- 2 PEEK primary sealing ferrules (re-order PCU-360-NF; with locking ferrules)
- 2 PEEK secondary locking ferrules (re-order PCU-360-NF; with sealing ferrules)
- 1 Reusable union body (aluminum)
- 2 Disposable PicoClear inserts (re-order PCU-360-I)
- 1 Swaging tool (aluminum)

Preparing the PicoClear Union for use with 360 µm OD Fused-Silica Tubing

**Union Assembly**

1. Place the insert into the union body. The insert will slide into the union body only when it is oriented correctly with the narrower side inserted first. Do not force the insert into the body of the union, but press it firmly into place (Figure 1).

2. Loosely assemble a primary sealing ferrule into a secondary locking ferrule (Figure 2)

**Caution:** Do not tighten the ferrules with no fused silica tubing inserted. Doing so will permanently compress the ferrule making it unusable.

3. Repeat with the remaining ferrule pair

4. Insert the primary/secondary ferrule pair into the union body (Figure 3)

5. Advance the primary sealing ferrule into the union body until you feel slight resistance.

**Caution:** Do not tighten any further! Compressing the clear insert with no fused-silica tubing in place will result in permanently damaging the insert!

**Note:** When advance to the appropriate point you will be able to view the tip of the primary ferrule through the window of the clear union

6. Repeat steps 4 and 5 with the remaining primary/secondary ferrule pair

The PicoClear union will have arrived assembled up to this point.

**Plumbing the PicoClear Union with 360 µm OD Fused-Silica Tubing**

1. Gently push 360 µm OD fused silica tubing through a primary/secondary ferrule pair into the union until the end of fused silica is positioned approximately halfway through the clear insert (Figure 4)

2.

3. Repeat for the opposite side of the union, gently pushing the second piece of tubing into the clear insert until it butts against the first piece of tubing. There should be no visible gaps between the two ends (Figure 5).

4.

5. The junction between the two pieces of tubing should be positioned within the center of the clear insert

**Note:** It is not necessary for the tubing junction to be at the exact center of the clear insert. A leak tight seal can be obtained even when the tubing junction is slightly off-center.

6. Tighten each primary sealing ferrule ¼ of a turn, alternating between each side (Figure 6).

**Note:** Successful plumbing requires that the tightening of the primary nuts be done in a balanced manner

7. Discontinue tightening when a visible gap at the tubing junction can not be seen and the insert becomes optically clear (Figure 6).
8. Tighten each secondary locking ferrule ½ to 2 revolutions to secure the tubing (Figure 7).

Replacements the Disposable Clear Insert
Depending on use each clear insert can be used for several plumbing cycles. Use the following guidelines for deciding when to replace the disposable clear insert.

- Fused-silica tubing cannot be inserted into the union from one or both sides
- Fused-silica tubing cannot be pushed all the way through during reaming according to the instructions for regenerating the union
- The insert fails to become clear when tightened
- Cracks are observed on/within the surface of the insert

Removing the Clear Insert
1. Remove all fused-silica tubing and both sets of primary/secondary ferrule pairs
3. Hold the union body upside down, so the circular window is facing upwards
4. Using the nipple of a primary/secondary ferrule pair, apply light pressure to the clear insert through the circular window in the bottom of the union body
5. The clear insert will easily fall out of the union body. Discard the used insert.
7. Follow the union assembly instructions on the opposite side to replace the clear insert

Regenerating the PicoClear Union
This procedure must be followed every time you break a connection prior to making a new connection. Inserting fused-silica tubing into the clear insert without swaging first will be difficult and will promote particle generation. Proper swaging reconditions the soft inner core of the PicoClear insert, renews the easy insertion of fused-silica tubing, and improves its longevity. Reaming the PicoClear insert also ensures no particles will be introduced to your plumbing.

Swaging Instructions
1. Remove all fused-silica tubing from the PicoClear union
2. Leave the clear insert inside the PicoClear union body
3. Remove one primary/secondary ferrule pair from the PicoClear union assembly. The remaining pair should be engaged only to the point of resistance
4. Insert the metal swaging tool into the open end of the union body and gently turn until the swaging tool will not advance further (Figure 8)
5. Remove the metal swaging tool from the union body
6. Replace the primary/secondary ferrule pair on the open side of the union
7. Repeat steps 3 – 6 on the other side

The PicoClear insert has now been properly swaged

Note: The fine tip on the PicoClear swaging tool can be easily damaged if handled inappropriately. The tip can be bent if dropped on the floor or any other hard surface (e.g. lab bench). A damaged PicoClear swaging tool will permanently damage the soft inner core of the PicoClear insert. Inspect the integrity of the swaging tool prior to use and replace often.

Using Fused-Silica Tubing to Ream the PicoClear Insert
1. Remove one primary/secondary ferrule pair from the PicoClear union assembly
2. Using a ~10 cm long piece of 360 µm OD fused-silica tubing, gently insert the tubing into the PicoClear union through the remaining primary/secondary ferrule pair
3. Gently push the tubing all the way through the union to the other side
4. Grasp the tubing from the open side of the PicoClear union, which contains no ferrules
5. Pull the tubing all the way through and out of the PicoClear union assembly
6. Repeat steps 1 - 5 on the other side

Use & Care
PCU-360
Clear Union

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