Packed Bed Assembly

1. What you see before you are the parts of two Swagelok stainless zero-volume-reducing unions. They are labeled now but if you say the word “label” it will toggle the labels on and off. Try it now.
2. Measure and mark 10-cm of the stainless-steel tubing and place it inside the metal tube cutter to the marked length and tighten it enough so that the cutter and tube are in contact.
3. Rotate the metal tube cutter around the stainless-steel tube and periodically secure the tube by tightening the tube cutter. Continue rotating until the stainless-steel tube is cut.
4. Use the metal file to file both ends of the cut tube until they are flat.
5. Deburr the opening of the tube with a deburring tool.
6. Unscrew the internal nut attached to the body of the fitting union and insert a stainless-steel frit into the body. Push the frit to the bottom using tweezers. Screw the internal nut back onto the fitting union body.
7. Place the external stainless steel nut onto the stainless-steel tube cylindrical end first.
8. Then place the back ferrule onto the stainless-steel tube large end first.
9. Place the front ferrule onto the steel tube large end first so that the cone side is facing the back ferrule.
10. Follow the ferrules with the wide end of the fitting union and finger tighten.
11. Using two wrenches seen in step one, tighten the external nut to the fitting body.
12. Repeat steps 6-10 for the opposite end and set aside this portion of the assembly until required.
13. Cut two 10-cm long pieces of PFA tubing using a polymer-tube cutter.
14. Unscrew the internal stainless steel nut from the fitting body. Locate the two small ferrules and place them to the side. Thread the internal nut onto the PFA tube cylindrical end first.
15. Collect the ferrule set that you put aside previously. Place the back ferrule onto the PFA tube big end first using tweezers if necessary.
16. Then place the front ferrule onto the PFA tube big end first using tweezers.
17. Insert the end of the PFA tubing into the fitting body and tube assembly applying pressure while finger-tightening. Then use a wrenches to tighten it even further.
18. Repeat steps 13-16 attaching the other PFA tube to the opposite side of the reactor assembly in a similar fashion.
19. Place a super flangeless nut onto the PFA tube ribbed side first leaving the narrow threaded part facing the top of the tube.
20. Then place the front ferrule onto the PFA tube next with the wide end facing the super flangeless nut. Follow this by the cone shaped back ferrule with the wide end facing the end of the tube.
21. Slide both the nut and ferrule to the top of the tube using the provided cap tighten the parts until secure.
22. Repeat steps 18-20 to the opposite side of the reactor.
23. Unscrew the external steel nut from the fitting body revealing the opening of the metal tube.
24. Remove the plunger from a plastic syringe. Insert the small end of the syringe in the metal tube. Then insert a plastic funnel to the large end of the syringe.
25. Add sand to the syringe tapping both the syringe and metal tube to allow the sand to settle into the tube. Pat down the sand using the flat back end of a drill bit.
26. Using the appropriate wrenches retighten the external to the fitting body assembly.