

# USING THE SGE MVSU MINI-UNION

The MVSU series of mini-unions from SGE are used to connect fused silica or metal columns and tubing with negligible loss of efficiency. The unions are glass lined ensuring an inert and precise internal diameter. Their low dead volume and low thermal mass make them the ideal connector for all capillary applications. The new higher temperature polyimide coatings used by many column manufacturers and of course metal tubing do not seal with glass Press-Fit unions. On the other hand, they are quickly and efficiently joined by an MVSU.

## A. JOINING TUBING OF SIMILAR OUTER DIAMETERS

If both pieces of tubing to be joined are of the same or similar outer diameters then the following method produces the best connection.

1. Select the MVSU using table 1.

103431	0.1-0.25 mm ID
103432	0.32 mm ID
103433	0.45-0.53 mm ID

**Table 1.**

2. Take the first piece of tubing and pass it through the nut and ferrule. Note that the ferrule should have the cone end towards the nut. It is then important to cut off a small length of tubing to obtain a clean square end and to remove any ferrule particles. For this procedure use a suitable capillary tubing cutter such as SGE part no. 0625010. Hold the tubing securely between thumb and index finger and scribe perpendicular so that the outer polyimide coating is scored. Grasp the tubing on either side of the scribe mark and pull gently apart with a slight bending motion. The tubing should snap cleanly leaving a square end.
3. Carefully push the tubing into one end of the MVSU union and finger tighten the nut. The end of the tubing should be approximately at the centre of the union. This is equivalent to around 11 mm measured from the back of the nut.
4. Tighten the nut using a 3/16" AF spanner (SGE part number 18500002) 1/4 of a turn at a time, until the tubing cannot be moved back and forward. DO NOT overtighten the nut.
5. Repeat step 2 above for the second piece of tubing to obtain a clean square cut end.
6. Carefully put the tubing into the other end of MVSU union and finger tighten the nut. Push the tubing into the union until it contacts the end of the first piece at the centre of the union. Tighten the nut using the 3/16" AF spanner until it is held firmly.

## B. JOINING TUBING OF DIFFERENT OUTER DIAMETERS

Where the tubing to be joined is of widely different diameters and the narrower tube will fit inside the larger tubing (eg: 0.22 mm to 0.53 mm ID capillaries) a slightly different method will minimise dead volumes and give the optimal joint.

*NB: In this situation it is important that the smaller OD material is not inserted inside the larger to any major degree. If this occurs, an unswept annular volume is formed which will contribute to peak broadening and cause loss of separation efficiency. For this reason we recommend that the following procedure is followed.*

1. Select the MVSU closest to the smallest tubing ID.
2. Take the smaller diameter tubing and pass it through the nut and ferrule, noting that the cone end of the ferrule should be towards the nut. Cut the tubing according to the method described in step A.2.(above).

3. Carefully push the tubing into the union and finger tighten the nut. Push the tubing through the union until it just protrudes through, a millimetre is ample.
4. Tighten the nut using a 3/16" spanner until it is held firmly.
5. Take the larger diameter tubing and pass it through the nut and ferrule. Note that it may be necessary to use a different diameter ferrule than that supplied with the MVSU. In this case select the appropriate ferrule from table 2.
6. Again cut the tubing to give a clean, square end.
7. Carefully locate the larger tubing over the end of the smaller tubing protruding from the union. Whilst holding the tube in this position

finger tighten the nut and then tighten with a 3/16" spanner until it is held firmly.

The procedures outlined above will give the best possible joint. When using metal tubing an appropriate cutter should be used to obtain a clean square end. The MVSU is supplied with graphite ferrules and these are recommended for most applications. However for GC-MS applications we would advise the use of Graphite Vespel® ferrules. Replacement ferrules can be ordered as below:

Tubing ID/mm	Graphite Ferrule	G.Vespel® Ferrule
0.1–0.25 mm	072630	072696
0.32 mm	072630	072697
0.45–0.53 mm	072629	072698

Table 2.

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