

## Rheodyne Tech Tip 6: Sample Loop Loading

### Partial-Filling

Use the partial-filling method if you need to conserve sample or if you want to vary sample volume frequently. In partial-filling, the syringe sets the volume injected onto the column. There is no sample waste, and the volume injected onto the column is equal to that dispensed from the syringe. Reproducibility is 1.0% relative standard deviation (RSD). The volume of the sample loaded is limited to half the sample loop volume. For example, the most you can load into a 200- $\mu$ L sample loop is 100  $\mu$ L. See [Figure 1](#). This limitation is due to the manner in which fluids move in tubes. Fluidic movement in tubes affects reproducibility. See [Tech Tip 7](#).

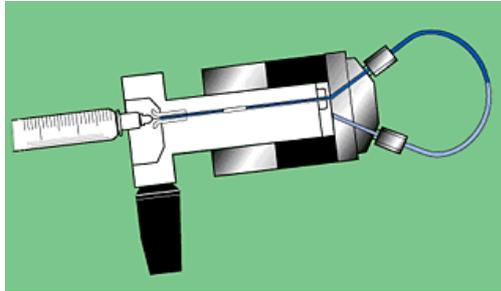


Figure 1. The sample loop can fill up to half the loaded volume in the partial-filling method.

### Complete-Filling

Use the complete-filling method if you have a sufficient amount of sample with which to work, if you do not vary sample volume, or if you need high reproducibility. In complete-filling, the loop sets the volume loaded onto the column. You use excess sample (two to five loop volumes) to replace all the mobile phase in the loop. See [Figure 2](#). Change the loop to vary the sample volume. Reproducibility is typically 0.1% RSD for loop sizes > 5  $\mu$ L. Accuracy is limited as loop volumes are nominal.

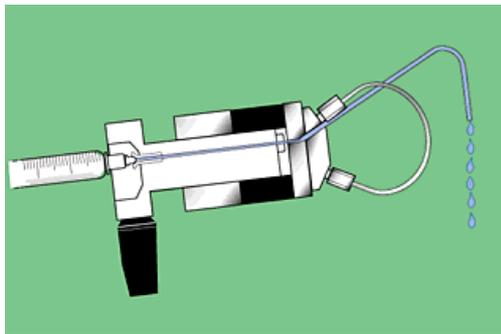


Figure 2. The sample loop is filled in excess in complete-filling method.

### Q: "Which method should I use and which Rheodyne® sample injectors use this method?"

**A:** There are two types of injectors available: dual mode and single mode. Dual mode injectors allow both partial- and complete-filling, whereas single mode injectors allow only complete-filling. See [Sample Injectors](#).

If you are collecting experimental data, sample is scarce, and/or you want to use different sample volumes, a dual-mode injector with a large volume sample loop is appropriate. Only dual-mode injectors allow the partial-filling method with which you can easily vary your volumes (up to half your sample loop volume) by setting the syringe volume. Once you begin routine analysis and/or you have an abundance of sample, either a dual-mode or single-mode injector is appropriate. Both types of injectors allow the complete-filling method with which you fill the sample loop in excess. Complete filling maximizes the reproducibility of your results.