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Subject: simple switched impactor system

I am attaching a couple of photos. One shows a simple switched impactor system that I built in about 10 minutes from parts in our lab. It seems to me that any of the GIF trailer PIs could make one of these - Swagelok sells all the parts except the impactor (we could loan up to 3 of these), and the isokinetic splitter (we could loan up to ~ 10 of these). The tubing is 3/4-inch OD, 5/8-inch ID, 304 stainless steel, and the fittings are all swagelok 316 stainless, 3/4-inch tube. The entire assembly is 23 inches long. The curved sections could be replaced with straight sections and elbows, since only sub-um particles are traveling that way. We use bends though since they minimize any chances for impaction and they eliminate the need for additional fittings (and potential leaks). We have a hydraulic tube bender, and would be happy to provide 90-degree bends of 3/4" OD s/s tubing (5/8" ID) for people who want to duplicate the system in the photograph.

The first image shows the impactor system. The 'total' aerosol would normally run through the straight branch when the ball valve is open. The delta-P across the impactor prevents aerosols from taking the other path. When the ball valve is closed, the aerosol is diverted through the impactor, and only sub-um aerosols pass that. The impactor is made to make the 1-um cut at 30 lpm, so people may have to pick off smaller flows downstream for their instruments. The splitter works well for flows below ~ 5 lpm.

The manual ball valve takes a little more work in documenting which size cut you are on at any given time.



switched_impactor.JPG



pickoff.JPG