

Performance Test of Carnet Technology's US DH-2A

Carnet Technology requested the FISP conduct a performance test on its US DH-2A, a handline collapsible-bag suspended-sediment/water-quality sampler. The US DH-2A is a replica, with minor modifications, of the FISP approved US DH-2.

The US DH-2A was tested in the FISP calibration flume at a flume flow velocity of 3.75 ft/sec using 3/16-, 1/4-, and 5/16-in internal diameter tetrafluoroethylene (TFE) nozzles and nozzle holder supplied by Carnet Technology. Tests were also conducted using the US DH-2 and Carnet Technology nozzles and nozzle holder for comparison.

The US DH-2A was checked for balance. In air, the sampler maintained a tail-down attitude as appropriate. Once fully submerged, the sampler assumed a horizontal attitude with the nozzle pointed directly into the flow. Hydraulic efficiency tests were conducted with 10 replications for each nozzle. All efficiencies were well within the FISP accepted range of 1.0 plus or minus 10 pct. The mean for the 3/16-in internal diameter nozzle was 1.02, 1.03 for the 1/4-in internal diameter nozzle, and 1.03 for the 5/16-in internal diameter nozzle. By comparison, the mean hydraulic efficiencies using the US DH-2 body with Carnet Technology nozzles and nozzle holder were 1.00, 1.03, and 1.01, respectively. An f-test of the variances showed that there was no statistically significant difference between the two samplers using the 3/16- and 5/16-in internal diameter nozzles. There was a statistically significant difference using the 1/4-in internal diameter nozzle with the US DH-2A having less variance than the US DH-2. A z-test of the means showed no statistically significant difference between the samplers. The tables summarize the results.

3/16-in nozzle	US DH-2A	US DH-2
Replications	10	10
Range	0.99-1.04	0.94-1.03
Mean	1.02	1.00
f/f-critical	1.61/3.18	
z/z-critical	1.39/1.96	

1/4-in nozzle	US DH-2A	US DH-2
Replications	10	10
Range	1.01-1.04	0.99-1.06
Mean	1.03	1.03
f/f-critical	4.13/3.18	
z/z-critical	-0.39/1.96	

5/16-in nozzle	US DH-2A	US DH-2
Replications	10	10
Range	0.99-1.06	0.98-1.03
Mean	1.03	1.01
f/f-critical	1.95/3.18	
z/z-critical	1.51/1.96	