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Influence of bubble size on effervescent atomization. Part 1: bubble characterization and mean spray features TAYLOR LEWIS, THOMAS SHEPARD, DAVID FORLITI, University of St. Thomas — In the effervescent atomization process a gas-liquid bubbly mixture is ejected from a nozzle with the goal of enhancing liquid break-up. In this work, high speed images are taken of the bubbly flow inside of an effervescent atomizer as well as downstream of the atomizer exit. The use of varying porous plate media grades and channel inserts at the air injection site of the atomizer permitted independent control of mean bubble size. Digital image analyses were used for bubble characterization and measuring mean spray features. The roles of air injection geometry on bubble population parameters inside of the effervescent atomizer are detailed. The effect of bubble size is examined at multiple gas to liquid flow rate ratios for which the bubbly flow regime was maintained. Results are presented demonstrating the influence of bubble size on the average jet width, jet dark core length, and liquid break-up.

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