coatings

Supplementary Materials: Experimental Qualification of the Process of Electrostatic Spray Deposition

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The droplet size distribution at the point that is located about 10 mm below from the nozzle was measured by PDPA(Phase Doppler Particle Analyzer) system. Figure S1 and S2 show the size distribution of air-spray jets with applying the external electric field of 0 kV and 15 kV, respectively. When the air-pressure is larger or the external electric field is higher, the spray shows the smaller droplet size and the narrower size distribution. It doesn't seem that the droplet size and size distribution have dominant effects on the estimation accuracy of the proposed method. For example, at higher air-pressure, the correlation between the jet uniformity and the coating uniformity is not better due to the turbulence even though the size distribution is narrower than at lower air-pressure. For this reason, two parameters of the jet stability and profile convergence were used for restricting the validated process area instead the droplet size and size distribution.

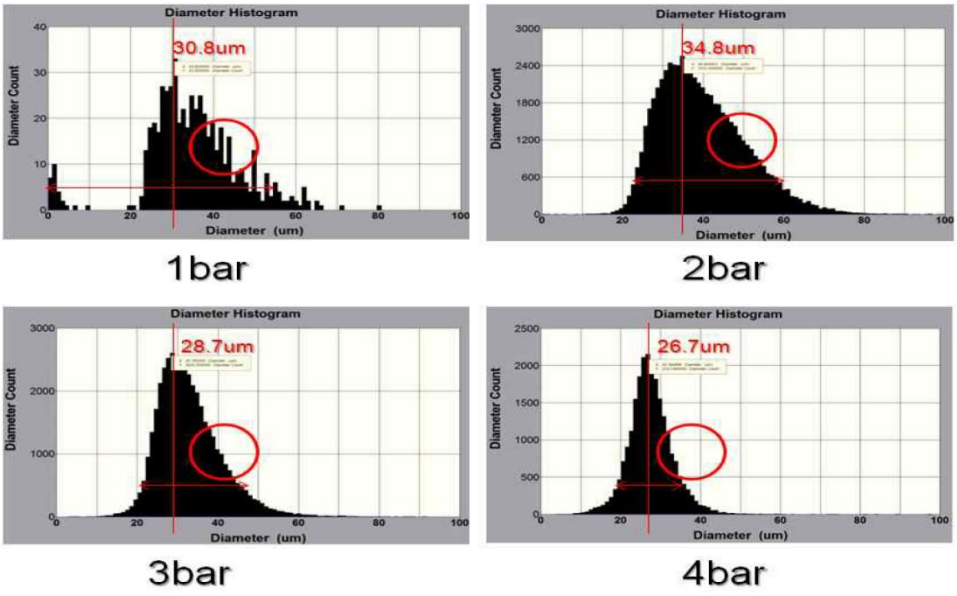

Figure S1. Measured droplet size of air-spray jets without applying external electric field.

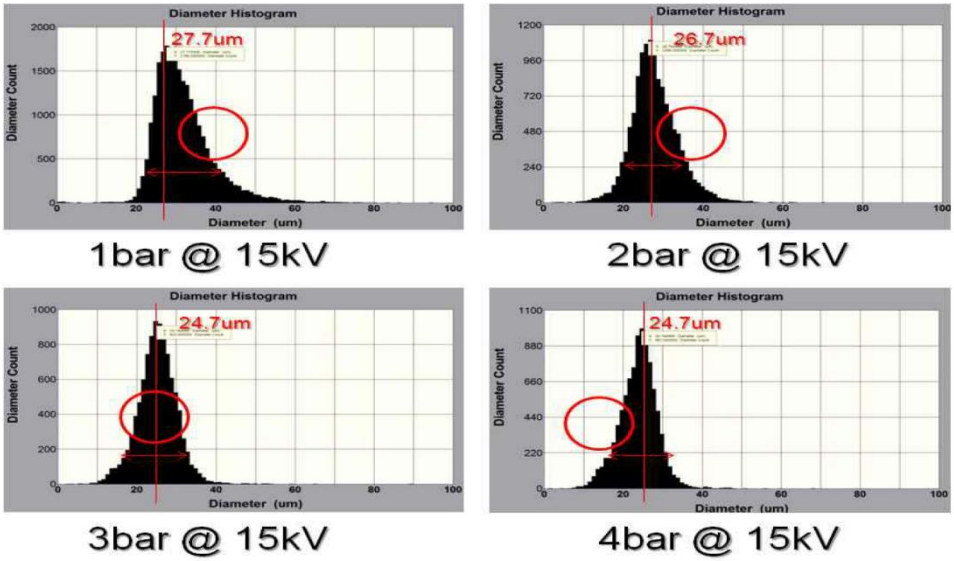

Figure S2. Measured droplet size of air-spray jets with applying external electric field of 15 kV.