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### **Spray Deposition of Liquid Films on Solid Surfaces**

Coating technologies such as spray painting, spray coating and ink-jet printing require the application of a thin ( $\sim 100 \mu\text{m}$ ) liquid film on a solid surface. The film must remain unbroken as it dries to form a coating that has no holes, bubbles or surface undulations. We have studied the formation and stability of thin liquid films created by the impact of droplets or sprays on a solid surface. Photographs and high-speed videos were taken of droplets and sprays as they impacted on both hydrophobic and hydrophilic surfaces, and formation of the liquid film observed. Numerical models were developed to simulate droplet impact and coalescence and air bubble entrapment in the film. The effects of varying surface roughness, wettability, and liquid viscosity on film stability were studied experimentally and analytical models developed to predict conditions under which the film would rupture.