

Making soap bubbles by blowing air onto a soap film

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ABSTRACT

Thin liquid films, such as soap films and bubbles, have been studied extensively over the centuries as they impact a wide range of phenomena, in physics, chemistry and engineering. Here, we discuss the formation of floating bubbles (see Fig. 1) made by blowing air through a nozzle onto a soap film [1,2]. We work either with circular bubble wands or vertically-falling soap films having an adjustable steady state thickness. We vary film size and thickness, nozzle radius, space between the film and nozzle, and gas density, and we measure the critical air speed above which bubbles are formed. The response is sensitive to containment, i.e., the ratio between film and nozzle sizes, and dissipation in the turbulent gas jet which is a function of the distance between film and nozzle. We rationalize the observed four different hydrodynamic regimes by comparing the dynamic pressure exerted by the jet on the film and the Laplace pressure needed to create the curved surface of a bubble.



Figure 1: The photograph illustrates soap bubble blowing with a commercial bubble wand.

[1] L. Salkin, A. Schmit, P. Panizza and L. Courbin. Generating Soap Bubbles by Blowing on Soap Films. *Phys. Rev. Lett.* 116, 077801, 2016.

[2] P. Panizza and L. Courbin. Blowing bubbles by the numbers. *Phys. Today* 69(7), 78, 2016.