Supporting Information

Blowing Drops off a Filament

R.P. Sahu[a], S. Sinha-Ray[a], A.L. Yarin*[a], B. Pourdeyhimi[b]

[a]Department of Mechanical and Industrial Engineering,

University of Illinois at Chicago,
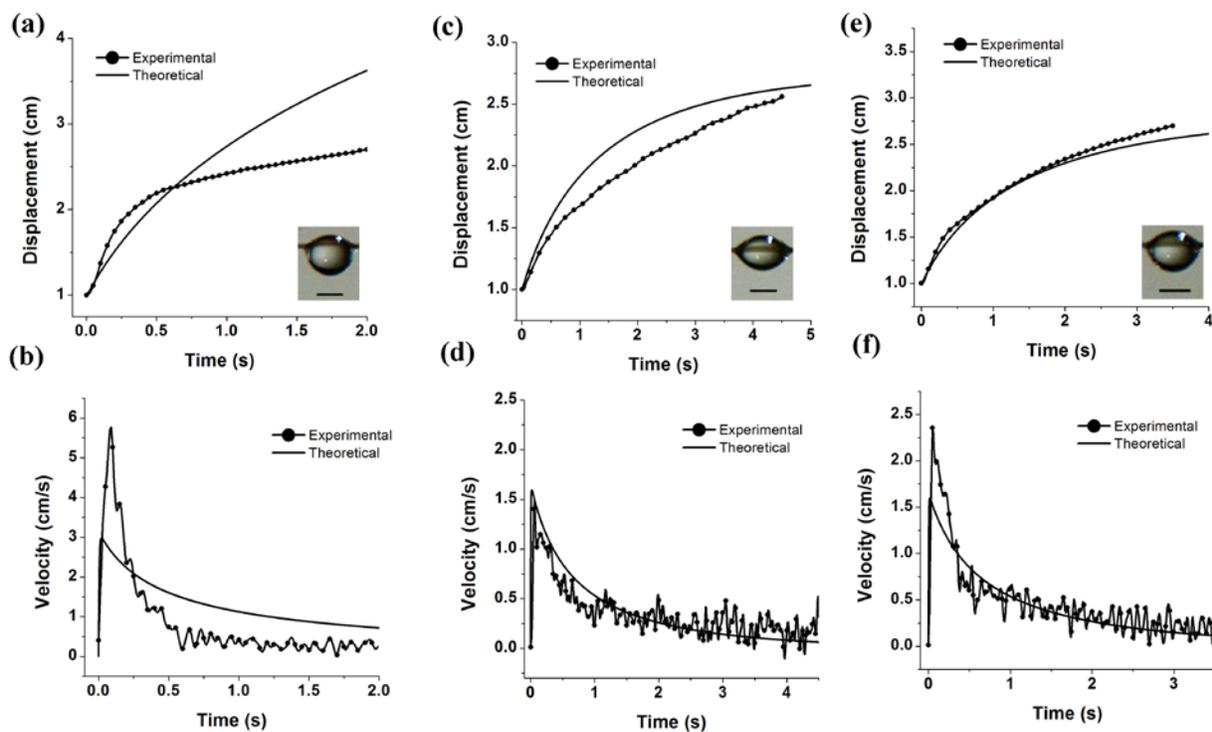
842 W. Taylor St., Chicago IL 60607-7022

E-mail: ayarin@uic.edu

[b]3427 The Nonwovens Institute, Box 8301,
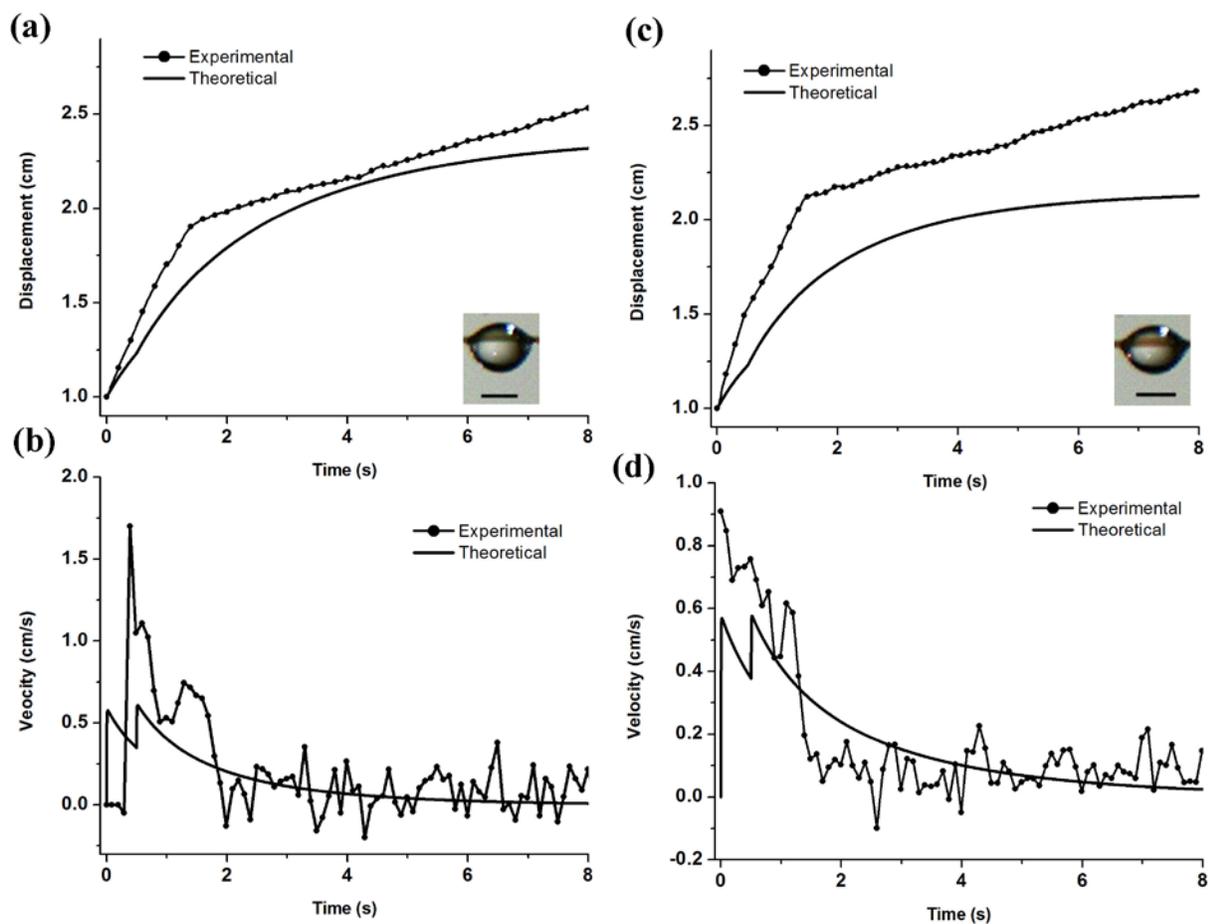
North Carolina State University

Raleigh NC 27695-8301
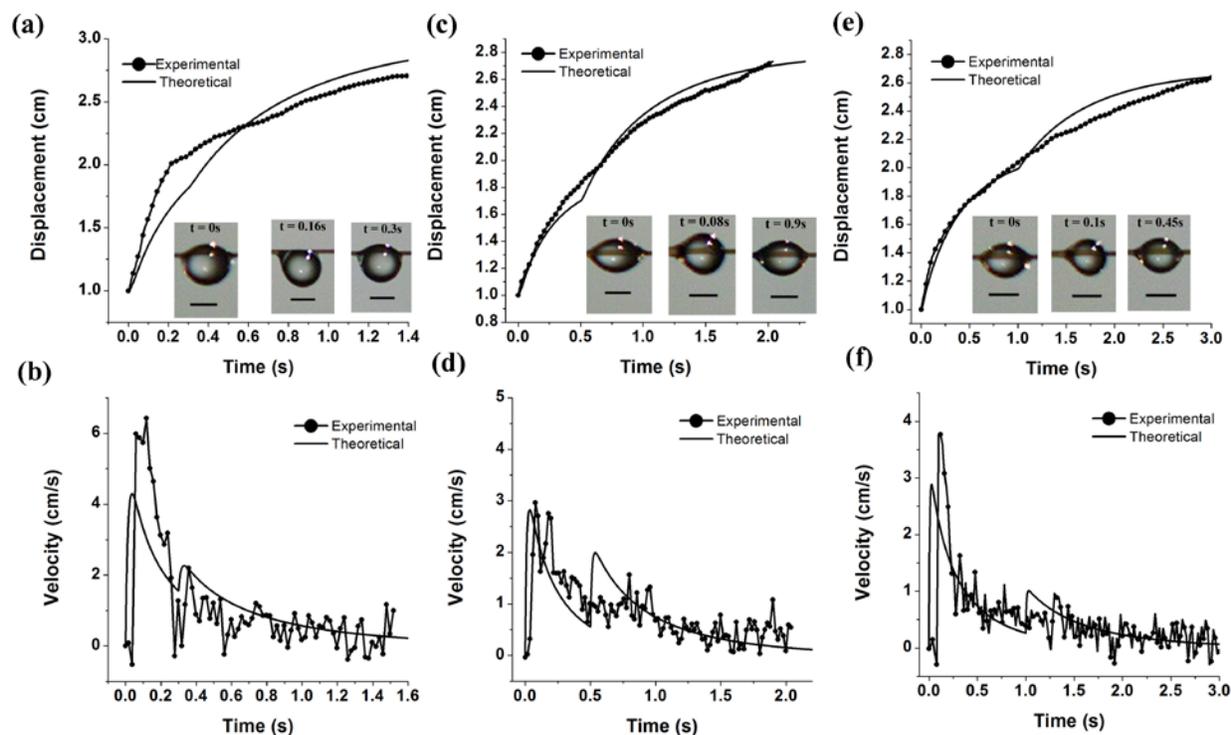
Correspondence to: A.L. Yarin (E-mail: ayarin@uic.edu)

Fig. S1 Typical displacement and velocity curves for three 50 cst silicone oil drops of different sizes at the blowing speed of 8.9 m/s. (a and b) $R_i = 0.45$ mm, (c and d) $R_i = 0.42$ mm, and (e and f) $R_i = 0.40$ mm. The insets show the drops on the filament. The scale bars are 0.5 mm.

Fig. S2 Typical displacement and velocity curves for two 50 cst silicone oil drops of different sizes at the blowing speed of 6.5 m/s. (a and b) $R_i = 0.41$ mm, and (c and d) $R_i = 0.37$ mm. The insets show the drops on the filament. The scale bars are 0.5 mm.
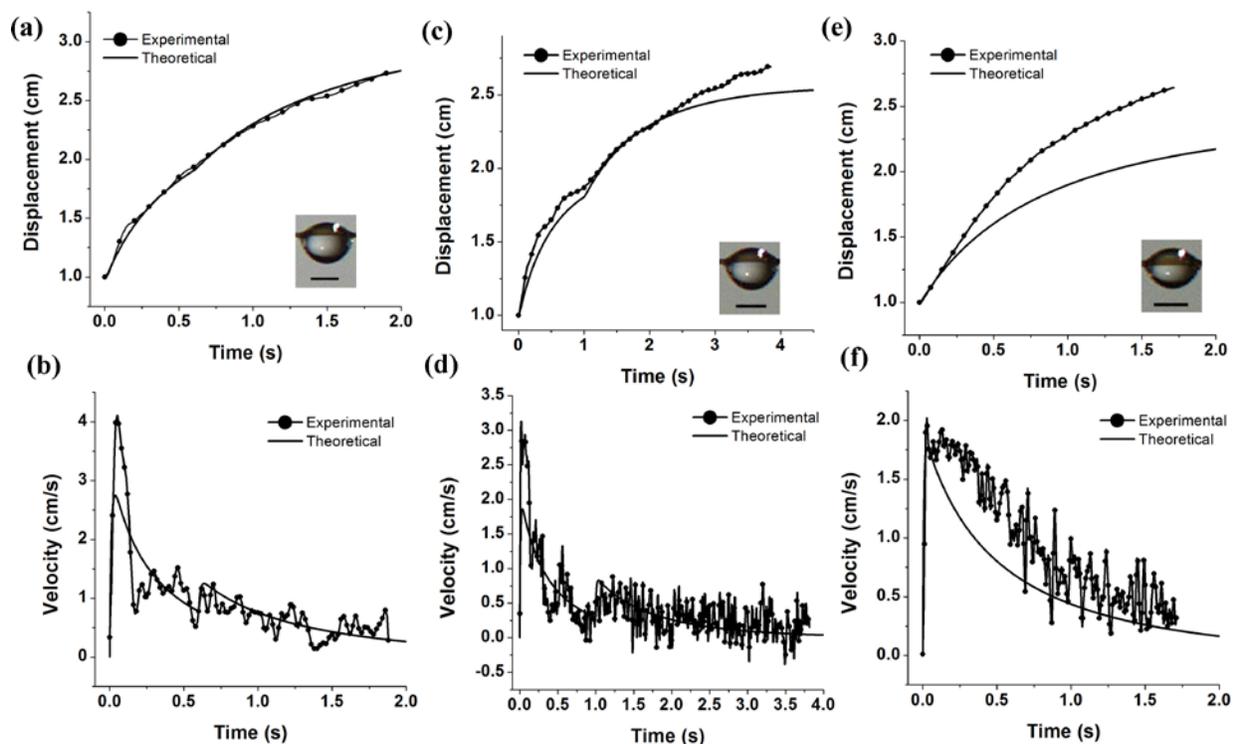
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Fig. S3 Typical displacement and velocity curves for three 20 cst silicone oil drops of different sizes at the blowing speed of 8.9 m/s. (a and b) $R_i = 0.47$ mm, (c and d) $R_i = 0.45$ mm, and (e and f) $R_i = 0.38$ mm. The insets show several snapshots of the drops on the filament; the scale bars are 0.5 mm.

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Fig. S4 Displacement and velocity curves for three 20 cst silicone oil drops of different sizes at the blowing speed of 6.5 m/s. (a and b) $R_i = 0.44$ mm, (c and d) $R_i = 0.41$mm, and (e and f) $R_i = 0.37$ mm. The insets show the drops on the filament. Scale bars are 0.5 mm.
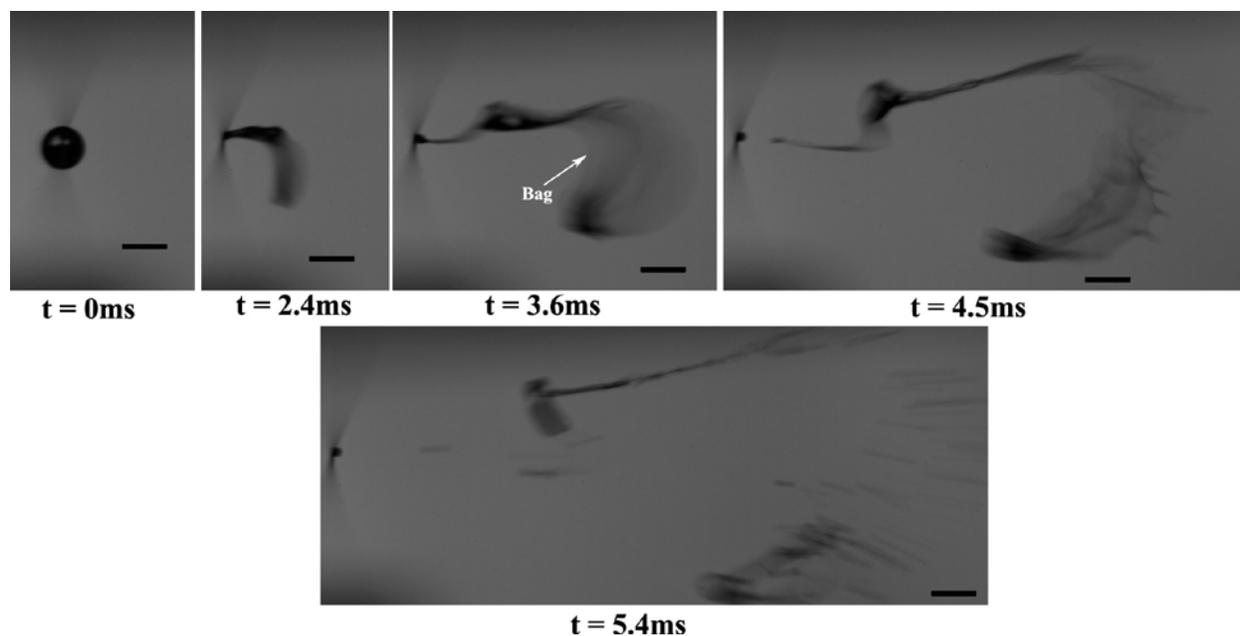
Fig. S5 Snapshots of the bag type breakup of a silicone oil drop at We = 17.17 and Oh = 0.07 at different time moments. The direction of blowing is from left to right and the volume-equivalent diameter of the initial drop $2R_i$= 1 mm. No stamen is visible here. Scale bars, 1 mm.
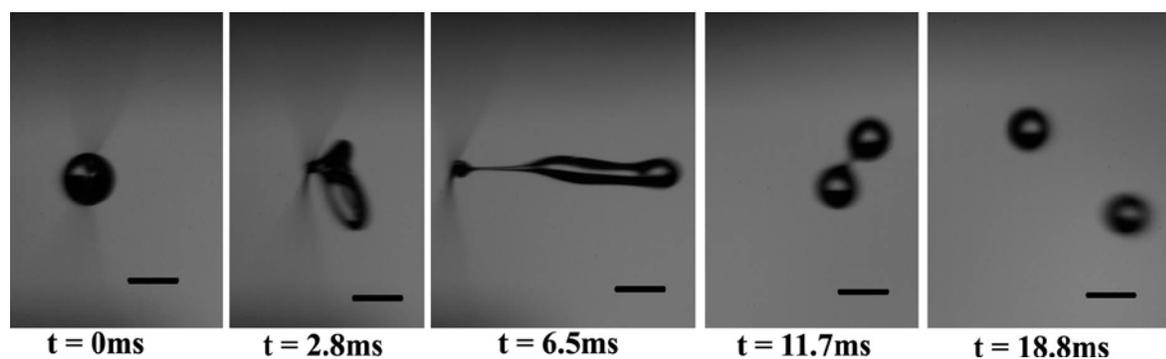
Fig. S6 The vibrational breakup of type V2 of a silicone oil drop at We = 17.73 and Oh = 0.13 at different time moments. The direction of blowing is from left to right and the volume-equivalent diameter of the initial droplet $2R_i$ = 1 mm. Scale bars, 1 mm.

t =0ms   t =7.33ms   t =11.33ms   t =15.33ms   t=18ms   t =32.67ms
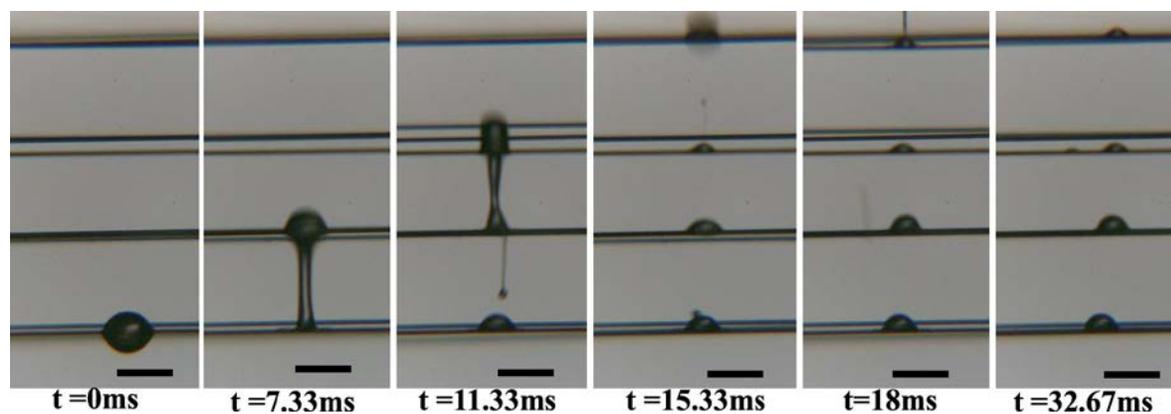
Fig. S7 A 10 cst silicone oil drop hoping across parallel filaments which are perpendicular to the air blowing direction. The inter-filament distance is 2 mm. The blowing is from bottom to top of the image. $V_0 = 14.43$ m/s. Scale bars, 1 mm.

t = 0ms   t =4.67ms   t =6.67ms   t =9.33ms   t =11.33ms   t =21.33ms
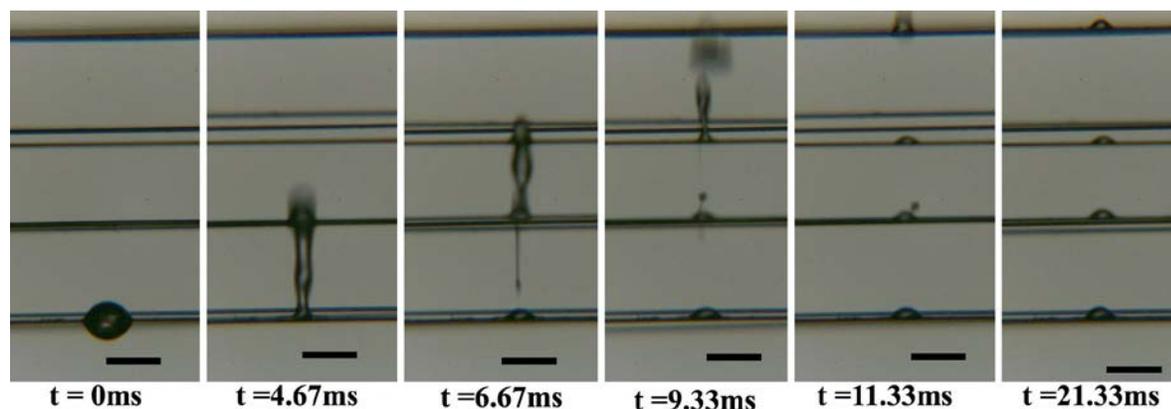
Fig S8 A 10 cst silicone oil drop hoping across parallel filaments which are perpendicular to the air flow. The inter-filament distance is 2 mm. The blowing direction is from bottom to top of the image. $V = 17.46$ m/s. Scale bars, 1 mm.