

Description of Additional Supplementary Files

File Name: Supplementary Movie 1

Description: Vertical lift of a 60 nm PS film off a water surface and subsequent failure.

File Name: Supplementary Movie 2

Description: : Smart process used to obtain and characterize a 34 nm freestanding PS film with gauge length of 8 mm.

File Name: Supplementary Movie 3

Description: : Free-standing tensile test of 19 nm polystyrene with a gauge length of 4 mm.