Supplementary Information

Supplementary S1: a) Example of PB profile at $Q = 20\mu l/min$, with nozzle height ($Z = 0$) and vertical offset ($Z = Z_{offset}$) indicated by red dashed lines. b) Corresponding $Z$ vs. PB Radius, $R$, plot for the region of the distortion with outliers removed. A third order polynomial is used to illustrate the shape of the distortion and the second order derivative set to zero determines the vertical height of the inflexion point, $Z_{offset}$ (red line).

Supplementary S2: PB Cross-Sectional Area, $S$, vs. Vertical Height, $Z$, for $Q = 100\mu l/min$ with $l_1 \approx 27.5$mm. The green line shows the fit of equation 5 to the relaxation region of the profile. Red dashed lines indicate the end of the relaxation.
region (red), defined as \( Z_{swell} \), as well as the Equilibrium Cross-Sectional Area, \( S_e \), and the Minimum Expansion Cross-Sectional Area, \( S_{Exp} \), all labelled accordingly.

Supplementary S3: Average Liquid Shear Rate, \( \dot{\gamma}_s \), vs. predicted Dimensionless Marangoni Force, \( \hat{F}_1 \), for surface shear viscosity data measured at PB lengths \( l_1 \approx 27.5\text{mm}, 15.0\text{mm} \) and \( 8.0\text{mm} \).