coatings

Supplementary Materials

Figure S1 shows the photoconversion of the acrylate and acrylate/PESiUA2 with and without air exposure prior to UV light irradiation. In all cases the reaction was very fast with a conversion of 50% within 1 s. The conversion rate at $t = 0$ was close to 2 s^{-1} and 1.3 s^{-1} for the acrylate and acrylate/PESiUA2, respectively. Increasing the concentration of siloxane comonomers led to a slight reduction of conversion, however exposure to air and resulting migration of the comonomer did not have a marked influence.

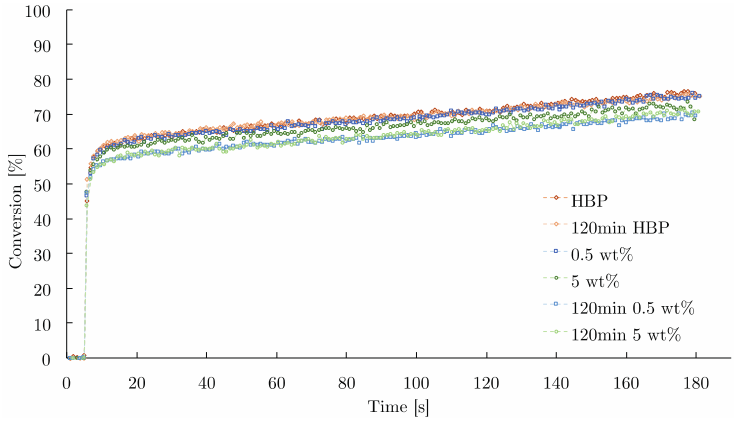
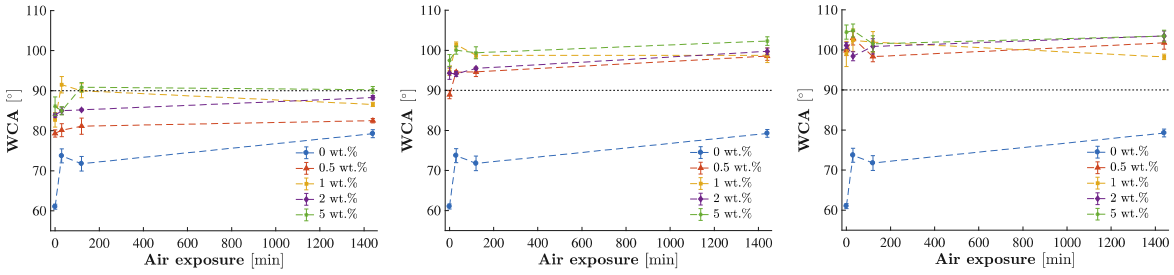


Figure S1. Photoconversion vs. time for HBP and HBP-PESiUA2 (0.5 and 5 wt %) without and with 120 min of air exposure prior to measurements. The UV light was turned on after 5 s.

The influence of the duration of the exposure to air prior to polymerization on the water contact angle (WCA) of the cured polymer surfaces is shown in Figure S2. The three siloxane comonomer surfactants led to an immediate increase of the WCA, which further increased upon air exposure. PDMSat formulations reached the hydrophobic limit at the highest investigated concentration (WCA of 90°), whereas the PSUiA formulations were systematically well into the hydrophobic regime, with a WCA close to 100°.



(a) (b) (c)

Figure S2. WCA vs. air exposure time of flat surfaces of acrylate and acrylate-siloxane formulations: (**a**) PDMSAT; (**b**) PESiUA1; and (**c**) PESiUA2. The dotted line at a WCA of 90° shows the limit between hydrophilic and hydrophobic materials.

The influence of photoconversion on the rheological behavior of the acrylate and acrylate/PESiUA2 is depicted in Figure S3. UV flashes of durations comprised between 200 ms and 2 s were applied to the samples and their dynamic viscosity was measured. The acrylate was Newtonian with a viscosity of 400 mPa s, which increased with increasing exposure to UV light. For flashes longer than 500 ms it became shear thinning, and a yield stress fluid with a considerable viscosity increase after 2 s of UV exposure. The behavior of the acrylate with 0.5 wt % of PESiUA2 was comparable. The formulation

with 5 wt % of PESiUA2 was also Newtonian with a viscosity of 500 mPa s, however it immediately became strongly shear thinning after the shortest duration of the UV flash (i.e., 200 ms).

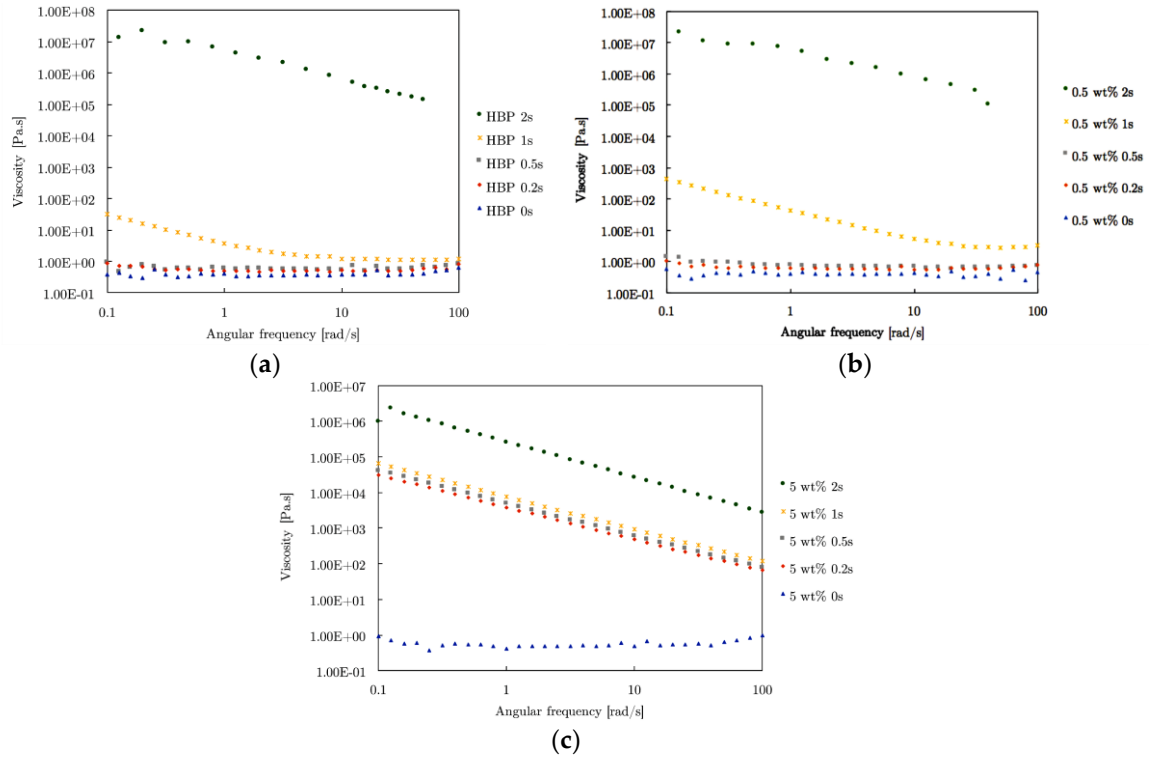


Figure S3. Viscosity of acrylate (**a**), acrylate + 0.5 wt % PESiUA2 (**b**), acrylate + 5 wt % PESiUA2 (**c**) as function of angular frequency, for increasing UV flash duration (0.2–2 s) as indicated.

Figure S4 shows electron micrographs of the synthetic lotus surfaces, based on the acrylate with 5 wt % PESiUA2, without, and with a creep time of 5 min under a pressure of 3 bars prior to photopolymerization. Careful observation reveals that the replication fidelity was improved with the application of creep. The WCA, both without and with creep, was found to be equal to 144° and 151.9°, respectively.

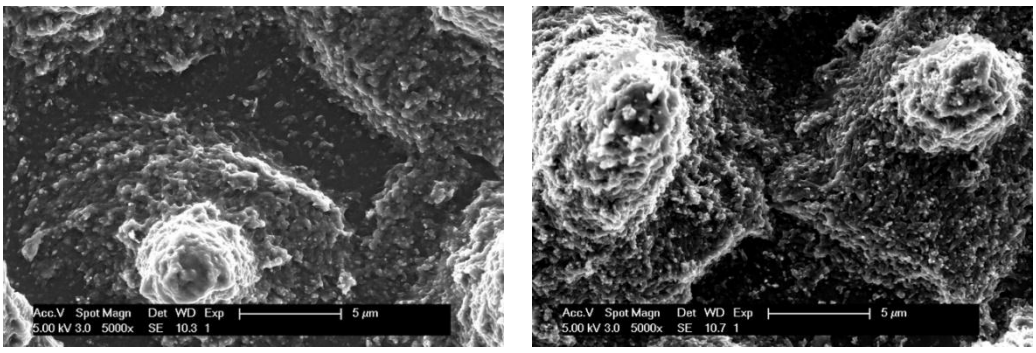


Figure S4. Scanning electron micrographs of the synthetic lotus surfaces, based on the acrylate with 5 wt % PESiUA2, without (**a**) and with (**b**) a creep time of 5 min under a pressure of 3 bars prior to photopolymerization.

Figure S5 shows a water droplet on the surface of the synthetic lotus replica surface, based on the acrylate with 5 wt % PESiUA2, for a creep time of 5 min under a pressure of 3 bars prior to photopolymerization. The WCA of this droplet was found to be equal to 151.9°.

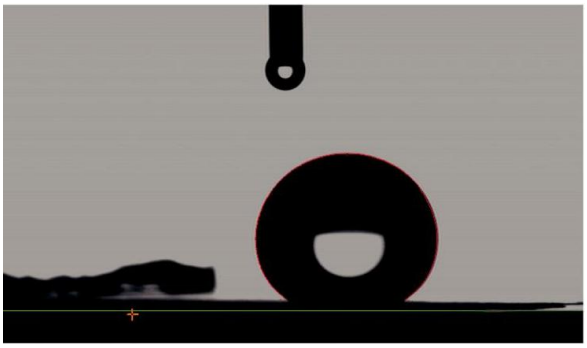


Figure S5. WCA of 151.9° measured on a synthetic lotus replica surface with 5 wt % PESiUA2 and 5 min of creep.

The water sliding angle (WSA) of the synthetic lotus surfaces based on the acrylate with 5 wt % PESiUA2 is reported in Table S1. With a water droplet of 10 μL, no sliding was observed until 90°. The volume was increased up to 100 μL, leading to large reductions of WSA. The volume of the water droplet was varied in some cases, and a decrease of the WSA was observed with increasing volume.

Table S1. WSA of synthetic lotus surfaces.

Material	Process Conditions	Droplet Volume (μL)	WSA (°)
Acrylate + 5 wt % PESiUA2	1 min creep	50	61
	1 min creep	100	30
	120 min air exposure	100	38
	0 min air exposure	100	45
	5 min creep	100	27