## **Supplementary Material**



 (a) (b)



 (c) (d)



 (e) (f)

FIG. S1. Several indentation cycles of (a) fused silica, (b) PR520 epoxy resin, (c) PMMA and HDPE at (d) 1 s/cyc, (e) 9.6 s/cyc and (f) 95 s/cyc.

Fig. S1a presents 20 cycles on Fused silica confirming the absence of hysteresis. Figs. S1b, S1c show several indentation cycles from the indentation tests of 300 cycles on PR520 epoxy and PMMA with a constant loading/unloading rate corresponding to a time of 9.6 s per cycle. Figs. S1d-f present the indentation cycles of HDPE with 1200 cycles of 1 s each, 300 cycles of 9.6 s each and 60 cycles of 95 s each, corresponding to the loading/unloading rates of 20 mN/s, 2.08 mN/s and 0.21 mN/s, respectively. For the sake of distinguishability, only 5 cycles are presented in these figures.



FIG. S2. Displacement drift data for load hold at 0.1 or 0.5 mN on fused silica, PR520epoxy and HDPE without any correction.

A huge and rather arbitrary scatter between indentation curves for load hold at small value (0.1 and 0.5 mN) can be seen in FIG.2 on all tested materials, including fused silica. Since the indentation equipment is not isolated from the environment, the thermal effects have very significant impact on the indentation results and have to be corrected. The correction procedure, described in the main body of the paper, gives excellent results on creep, cyclic and quasistatic tests. An example of the corrected data is presented in FIG S3.

 

 (a) (b)

FIG. S3. Effect of the thermal drift correction procedure on long creep test on HDPE at 5 mN: (a) before the correction, (b) after the correction