Electronic Supplementary Material (ESI) for Soft Matter.

Electronic supplementary information (ESI)

Beam steering by Liquid Crystalline Elastomer Fibres

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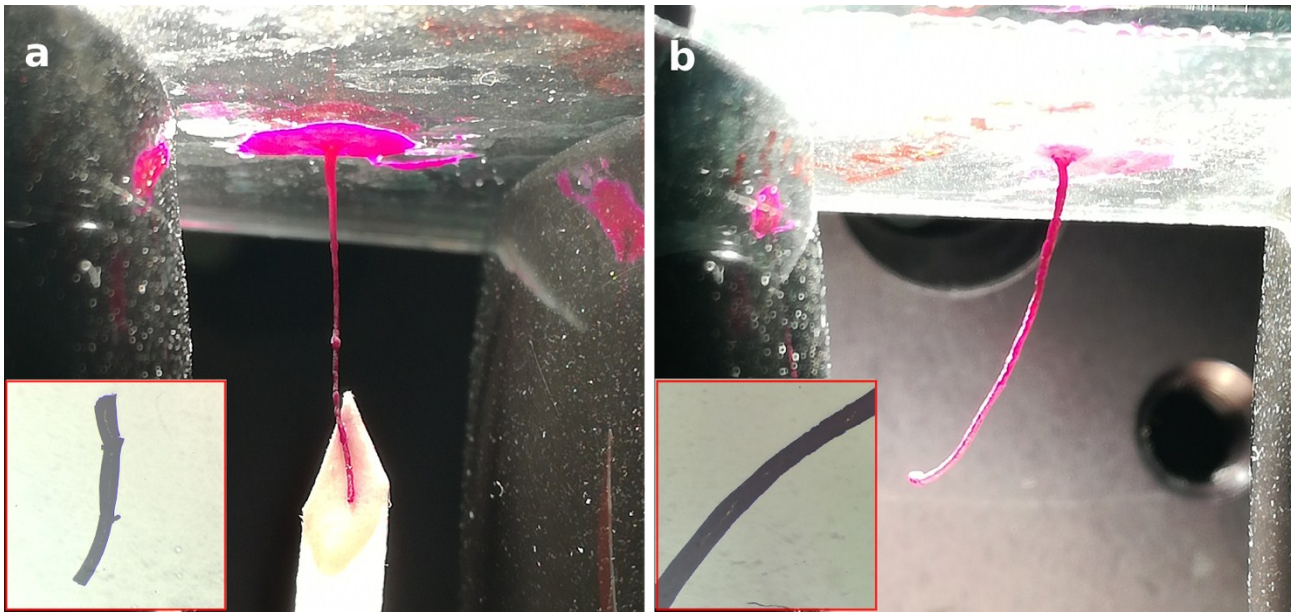

Figure S1 Optical images of a stretched (a) and a rotating fibre (b). In the insets are reported images taken by an optical microscope (10x objectives).

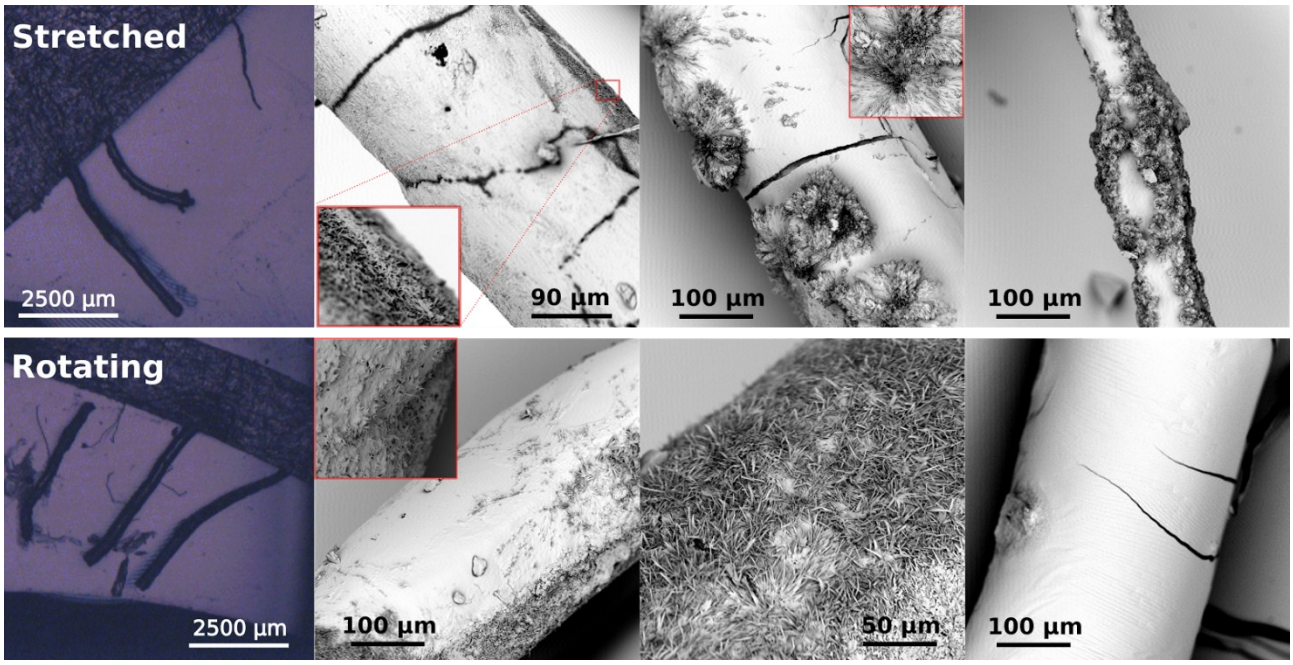

Figure S2 Scanning electron microscope (SEM) images of a stretched (a) and a rotating fiber (b). No surface wrinkles can be associated with the two different fiber formation. Several surface formations are observed both on the stretched fiber and on the rotating one as exotic micrometric filament aggregations.

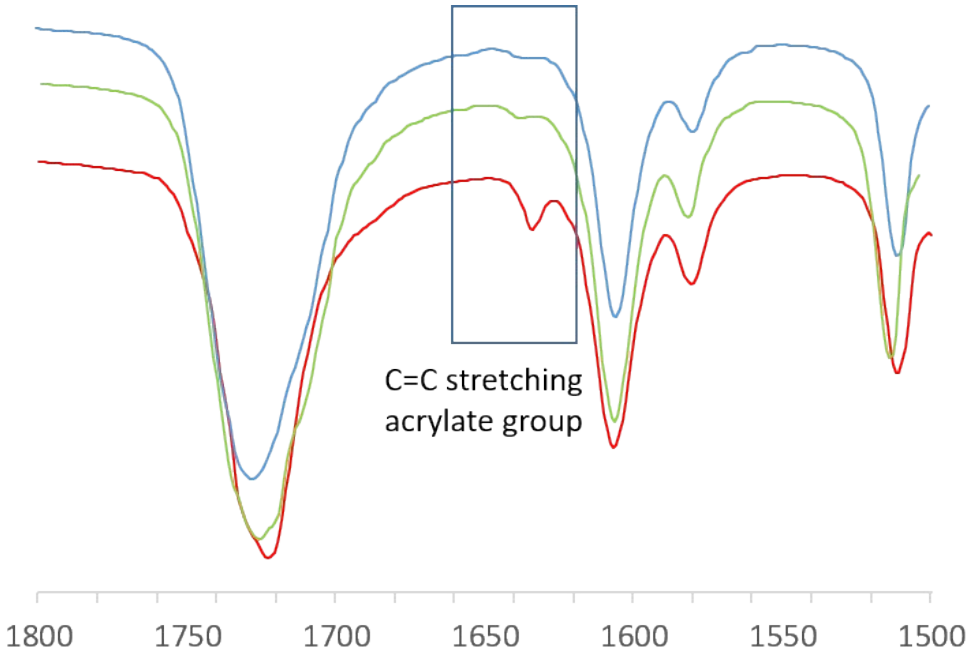

Figure S3 ATR spectra of the monomer mixture (red line), the fibre polymerized at room temperature (green line), a fiber polymerized first at room temperature and then at 45 °C (blue line).

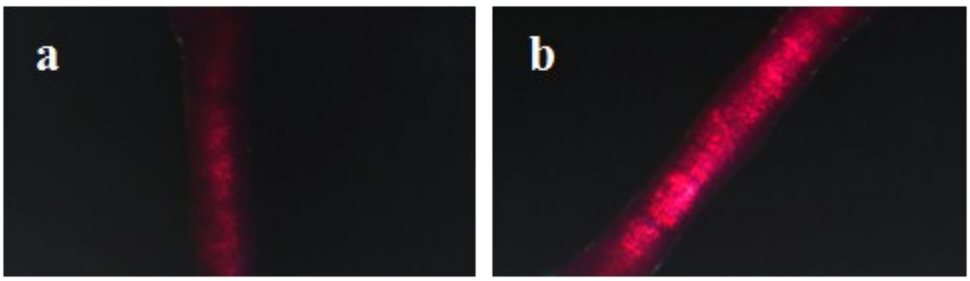

Figure S4 POM images of a stretched fibre. Image of a fibre parallel to the cross polarizer (a) and the same fibre rotated by 45° in respect to the analyser (b).

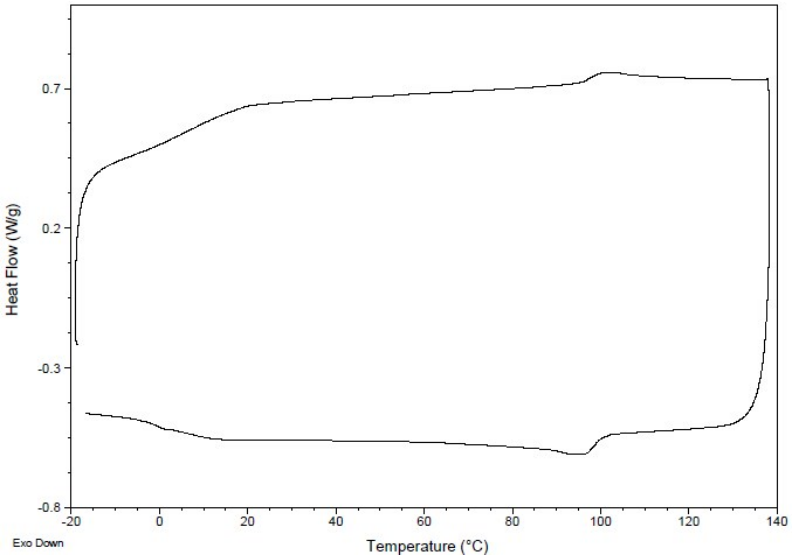

Figure S5 DSC trace of the second heating and cooling cycle (20°C/min) for a LCE fibre.

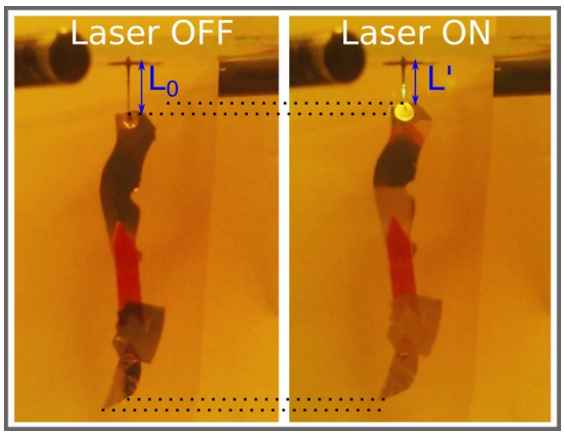

Figure S6 Light induced contraction of a 2 mg fibre subjected to a 72 mg cargo.

Movie S1 2 mg fibre strength holding and picking up a 72 mg weight.

Movie S2 Rotation of a LCE fibre from the side and top view. Once the activation laser is turned on, the LCE fibre rotates counter clockwise, and it relaxes to the rest initial position once the excitation is turned off with a clockwise rotation. From the top view (second part of the video) is possible to evaluate the fibre rotation angle. Increasing the green laser power the arrow indicates bigger angles until a complete revolution is performed.

Movie S3 Recorded beam steering of a red laser beam impinging (from the right side of the screen) on the glass mirror held by the LCE fibre. It is possible to control the deviation angle through the actuation green laser. Also in this case, a complete revolution of 360° is accomplished.