

SUPPLEMENTARY INFORMATION

Laser-tunable Raman markers based on glass-ceramic/ β -carotene mixtures for advanced anti-counterfeiting applications

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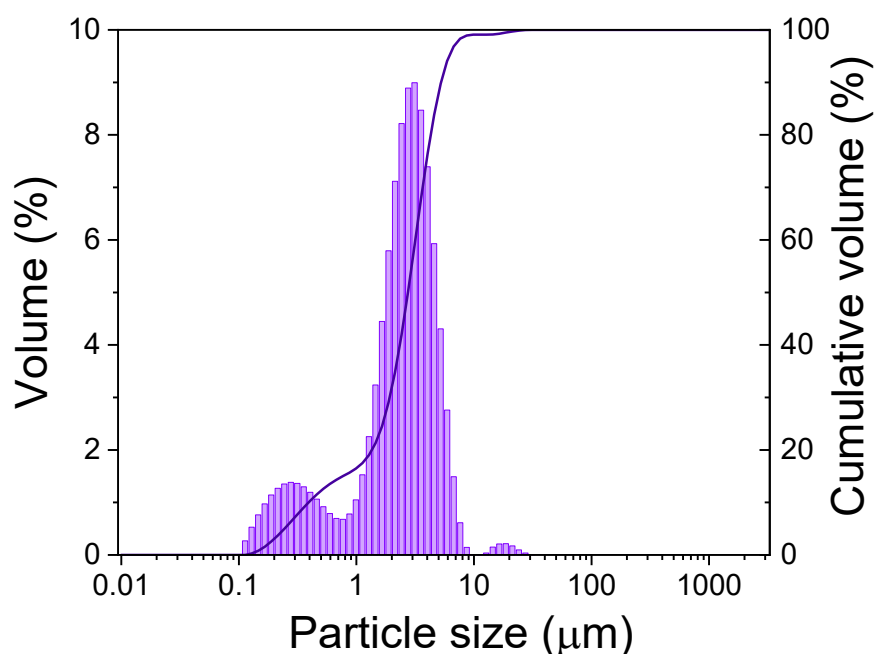


Figure S1. Particle size distribution of the carbon black (CB) used.

Table 1: Summary of the conditions for all the Raman measurements carried out in this work.

Material	Measurement Power (mW)	Measurement Time (s)	Figure
b-carotene	45	0.5	Figure 2
RM	290	0.1	Figure 2
RM/b-Carotene	45	1	Figure 4

RM/b-Carothene 80/20+ 5% CB	6	40s	Figure 5
b-Carothene (with temperature)	45	400	Figure 6
RM/b-Carothene (with temperature)	45	2	Figure 6
RM/b-Carothene 80/20+ 5% CB in epoxy	17	10	Figure 8

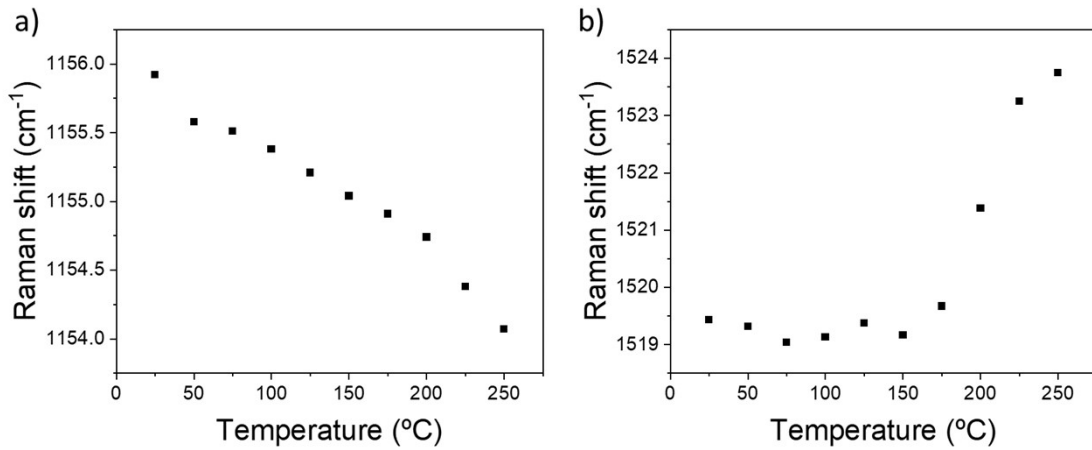


Figure S2. Raman shift evolution of a) 1156 and b) 1518 cm⁻¹ β-carotene Raman bands as a function of temperature.

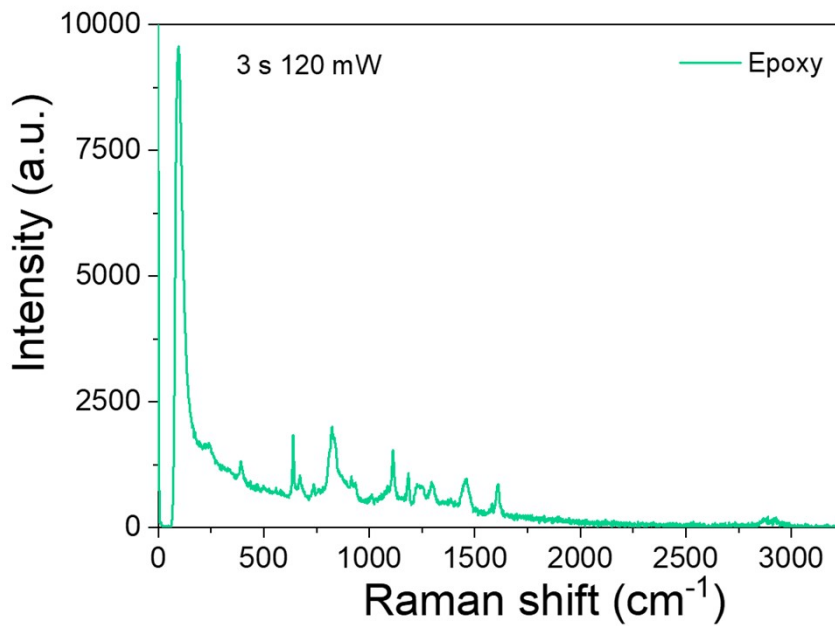


Figure S3. Raman spectrum of the epoxy used for preparing the demonstrator with customizable markers.