**Supplementary Materials for**

**Ductility by shear band delocalization in the nano-layer of gradient structure**

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**Digital image correlation imaging**

The digital image correlation (DIC) imaging was attached to provide a large optical field-of-view with representative statistics on the top NS surface of GS samples. The DIC tensile tests were also conducted in CG samples for comparison. The specific commercial VIC-2D software was utilized for DIC data analysis and strain-field calculation. The longitudinal (axial) strains () in the gauge section were recorded continuously with increasing applied tensile strain (). The localized strain rate () was also calculated in terms of . Also, the interrupted DIC tensile tests were conducted for the microstructural observations, texture analysis, and Vickers micro-hardness (Hv) measurements in the NS surface layer.

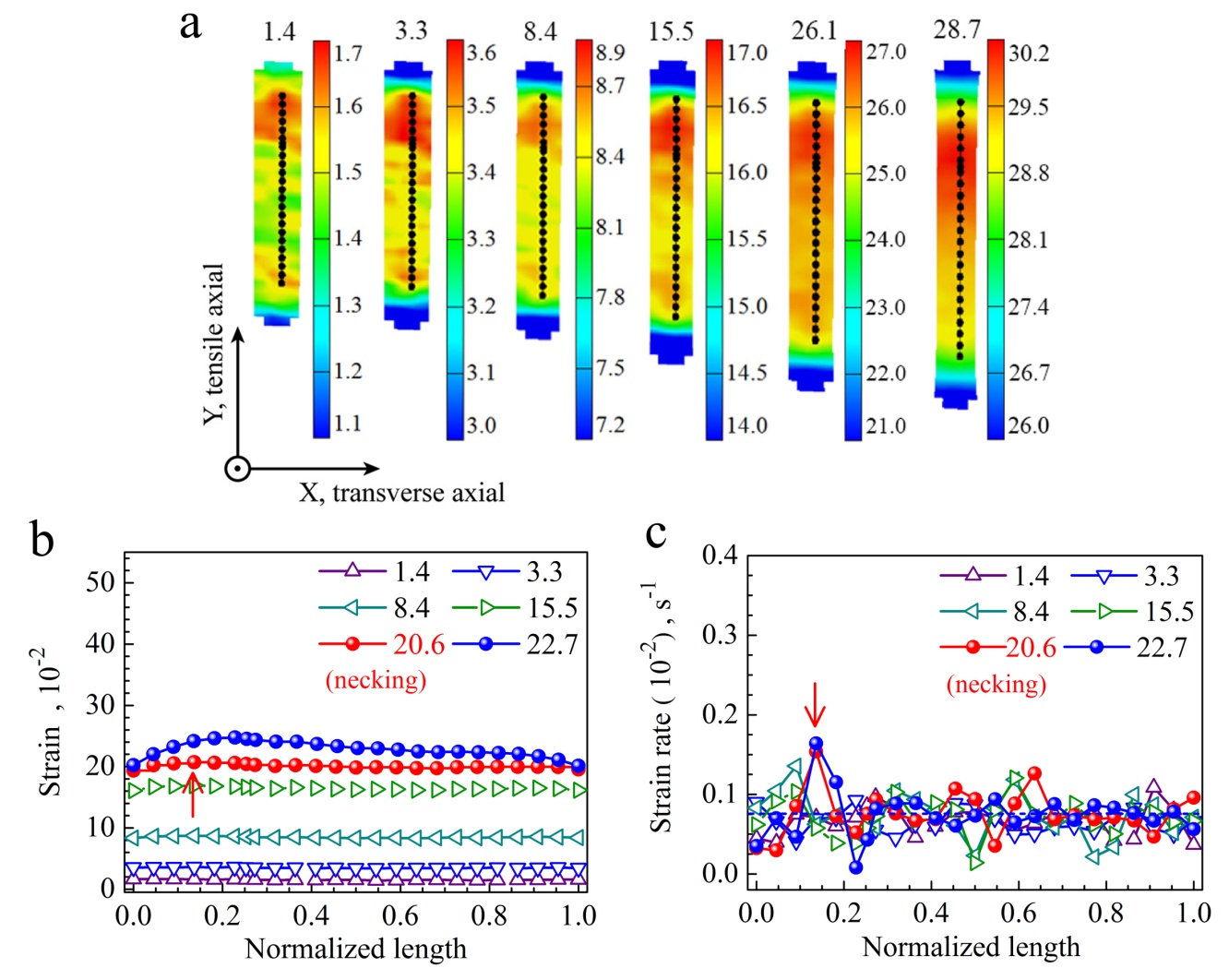


Fig. S1 Tensile deformation in homogeneous CG sample. (a) Longitudinal strain () contour maps at varying applied strains (). Number above each contour: , %. Scale bar: the range of inside each contour. Two numbers at both ends: maximum and minimum of . (b) and (c) Distribution of both and . Horizontal dashed line in (C) applied strain rate of 8×10-4 s-1.

During uniform tensile deformation, is almost uniform, even more or less waved (Fig. 2d), and equal to everywhere along the line in the gauge section. is also uniform, equal to . Upon diffused necking at EU of 26% (➁ in Fig. 2b), rises moderately (indicated by an arrow in Fig. 2b) at the place where the neck is (arrow in Fig. 2b), but with an evident rise of .