

## Supporting information : Self-organization at the crack tip of fatigue-resistant thermoplastic polyurethane elastomers

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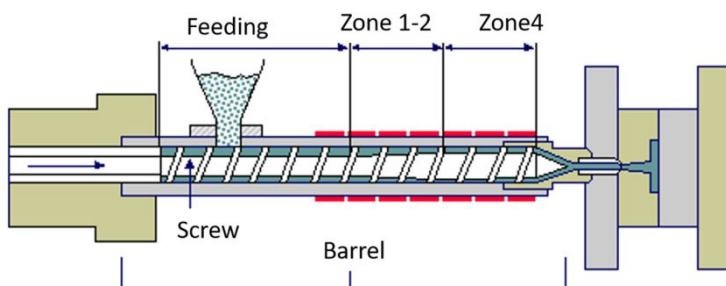
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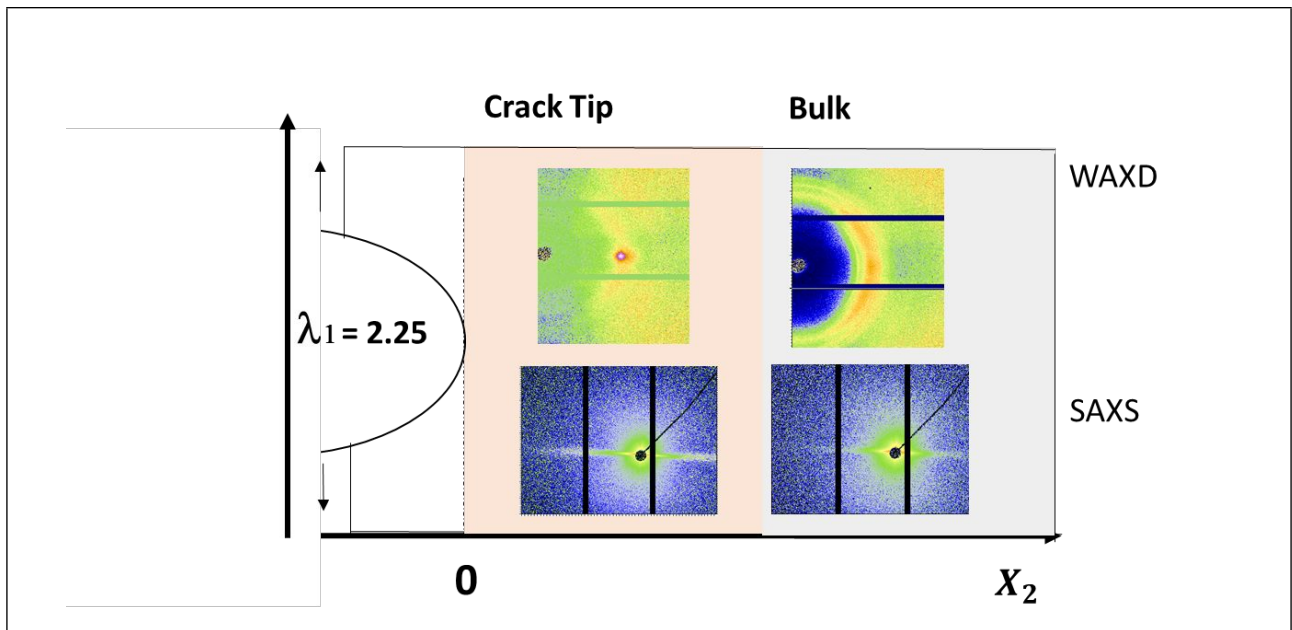
All TPU samples were injected using different temperatures for the single section of the barrel (Table S 1) as suggested by BASF and schematically showed in Figure S 1



**Figure S 1 Schematic of injection process with the different zones of the barrel**

Barrel / Sample	Zone 1 (°C)	Zone2(°C)	Zone4(°C)	Nozzle (°C)	Mould (°C)
TPU_XTAL	170	180	190	185	30
TPU_SOFT	190	200	205	200	30

**Table S 1 Barrel temperature profile for the injection procedure**



**Figure S 2** Representative in-situ WAXD and SAXS 2D pattern for TPU\_SOFT close and far from the open crack for pristine sample monotonically strained at  $\lambda_{\max}=2.25$  (a).