

Abstract Submitted  
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**Constitutive modelling of binary blends of monodisperse polymers**<sup>1</sup> DANIEL READ, SATHISH SUKUMARAN, KAMAKSHI JAGAN-NATHAN, University of Leeds, MICROSCALE POLYMER PROCESSING 2 TEAM — We present a tube-model theory to describe the non-linear rheology of entangled blends of long and short monodisperse polymers. For each test chain it is conceptually important to distinguish a “thin tube” (including entanglements with all other chains) and a “fat tube” (including entanglements with the slowly-moving long chains only). We have developed both a detailed version of the theory, including correlations along, and between, both the thin and fat tubes, allowing for different constraint-release rates on each, and also a simplified “4 tensor” constitutive model. We compare both with experimental rheometric data, noting in particular the variation of effective stretch relaxation time of long chains with dilution in short chains. We also use the simplified model to simulate the flow of a blend in complex geometries, again comparing against experimental data.

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