

Formulation	Parameters
	<i>Linear, isotropic elasticity</i>
$\varepsilon_{ij} = \frac{1}{E}[(1+\nu)\sigma_{ij} - \nu\sigma_{kk}]$	$\underline{\varepsilon}_{ij}$ strain tensor $\underline{\sigma}_{ij}$ stress tensor $\underline{E}$ Young's modulus [10 GPa] $\underline{\nu}$ Poisson's ratio [0.25]
	<i>Mohr-Coulomb failure criterion (frictional plasticity)</i>
$\sigma_1 - \sigma_3 > p \cdot \sin(\phi') + C' \cdot \cos(\phi')$	$\underline{\sigma}_{1,3}$ maximum, minimum principal stress $\underline{p}$ pressure $\underline{\phi}$ rock angle of friction [ $30^\circ$ ( $19^\circ$ )] $\underline{C}$ cohesion [1 MPa (0.91 MPa)]
	<i>Thermally activated creep</i>
$\dot{\varepsilon}_v = A(\sigma_1 - \sigma_3)^n \exp(-Q/RT)$	$\dot{\varepsilon}_v$ viscous strain rate [ $6.3 \times 10^{-15}$ s $^{-1}$ ] $\underline{A}$ pre-exponential const. [ $4 \times 10^{-34}$ Pa $^{-4}$ s $^{-1}$ ] $\underline{n}$ power-law exponent [4]

<u>R</u>	activation energy [135 kJ mol <sup>-1</sup> ]
<u>T</u>	gas constant [8.314]
	temperature
<i>Fault friction</i>	
<u>τ</u>	fault shear stress
$\tau > \mu_d \sigma_n$	dynamic friction coefficient [0.2]
<u>σ<sub>n</sub></u>	fault normal stress
<i>Other</i>	
<u>ρ</u>	density [2800 kg m <sup>-3</sup> ]
<u>g</u>	gravity [9.81 m s <sup>-2</sup> ]

**Table DR1:** Summary of model methods and rheologies. Prescribed parameter values given in brackets. Note that we have used adjusted values (in parentheses) for rock angle of friction,  $\varphi'$ , and cohesion,  $C'$ . These values reflect the reduced strength of a crust saturated by pore fluids at hydrostatic pressure. Parameters for thermally activated creep are derived from Paterson and Luan (1990).

## REFERENCES CITED

Paterson, M. S., and Luan, F. S., 1990, Quartzite rheology under geological conditions, in  
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Tectonics, Geological Society Special Publications, v. 54, p. 299-307.