

19.D4 We want to compute the maximum temperature change allowable without thermal shock for these several ceramic materials, which temperature change is a function of the fracture strength, elastic modulus, and linear coefficient of thermal expansion. These data and the ΔT_f 's are tabulated below. (Values for E , σ_f and α_l are taken from Tables B.2, B.4, B.6 in Appendix B.)

Material	σ_f (MPa)	E (MPa)	α_l (°C) ⁻¹	ΔT_f (°C)
Soda-lime glass	69	69×10^3	9.0×10^{-6}	111
Borosilicate glass	69	70×10^3	3.3×10^{-6}	300
Aluminum oxide (96%)	358	303×10^3	7.4×10^{-6}	160
Gallium arsenide	57	85×10^3	5.9×10^{-6}	114