Table 1-14 Cont'd.

Material		$\sigma_t°$ ($\sigma_f°$)	$\sigma_e°$	$\sigma_{en}°$ max	Modulus of elasticity		*F.T.*	$\rho_\gamma°$	σ_r^0, MYS
Profile	Designation Dim. ,t_T, load				$E°$ $(E/\rho_\gamma)°$	$G°$ $(\nu_p°)$			
Poly-silicon	Si, tension bending	1.38 - 2.6 (2.5)	2.29 - 4.28	2.88 - 3.27	1.42	(0.79)	0.85-1.9	0.26	…
Tungsten Carbide	*W* *WC*	1.3-3.5	3.5-5.0	…	3.6 6.4	3.6 (0.99)	…	2.19 1.78	…

* Quenching temperature t_T is shown in parenthesis with an asterisk in °C; all properties at 20°C; **Young's modulus E =112.8 GPa; shear modulus G = 44.1 GPa; Poisson's ratio ν_p = 0.279; tensile (UTS)strength σ_t = 1.13 GPa; yield stress σ_e= 0.785 GPa; endurance limit σ_{en} =0.260 GPa (approximately, on the basis of 10 million cycles); elasticity temperature coefficient α_E =- 4.5×10^{-4} K^{-1} (approximately); temperature coefficient of linear expansion α_L = 15.5×10^{-6} K^{-1},E/ρ_γ=12.84 MN·m/kg=12.84×10^6 m^2/s^2; specific gravity ρ_γ= 8.8 g/cm^3 (8,800 kg/m^3), and *MYS* σ_r=300 MPa. *F.T.* represents fracture toughness in, MPa· $m^{1/2}$, and $\sigma_f°$ is the relative fracture strength σ_f / σ_t for brittle material. Thermal properties of elastic materials are shown in Table 7-6. Superscript ° indicates relative values; recommended factor of safety is not less than 1.3. *** Data (A. Khan *et al*., 2004; D. Munz *et al.*, 1999) for amorphous silicon nitride films and cantilevers; data ^ after E. Wong *et al*., 1997, P. Poncharal *et al*., 1999, V.N. Popov, 2004; data^^for diamond-like after X.Blase *et al*.(2004), data $ of Thornel fiber ∅ 11μm; for AlBeMet (62%*Be*, 38%*AL*) alloy MYS is equal σr=17.3 MPa; t/c$ data belong to tensile (above) and compression (below) test. Sign … shows that this parameter is not applicable or the author does not have reliable information and recommends to verify data in Handbook by J.M. Shackelford and W. Alexander, 2001; Smithells Metals Reference Book, 2004; publications by W.N. Sharpe, 2002; M.J. Madou, 2002; and B. Bhushan, ed., 2004.

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