Table 1. Calculated values of radial, circumferential and shear stresses developed in the matrix for the cases of cavity, rigid and elastic inclusion upon subjection to external hydrostatic pressure

Case	Reference	σ_{rr} in matrix	$\sigma_{\theta\theta}$ in matrix ($=\sigma_{\phi\phi}$)	Absolute value of τ_{max} (at $r=a$) in matrix
I. Cavity (a) Zero internal pressure	Present calculation	$-P(1-a^3/r^3)$	$-P[1+1/2(a/r)^3]$	$3/4\ P$
(b) Internal pressure ($-P_i$) only	Present calculation	$-P_i(a/r)^3$	$P_i/2(a/r)^3$	$3/4\ P_i$
(c) Internal pressure ($-P_i$) and external pressure ($-P$)	Present calculation	$-P+(P-P_i)\dfrac{a^3}{r^3}$	$-P-(P-P_i)\dfrac{a^3}{2r^3}$	$3/4\ (P-P_i)$
II. Rigid inclusion	Hahn and Rosenfield's (1966) equation	—	—	$\approx P/3$
	Present calculation	$-P\left[1+\dfrac{2(1-2\nu)}{1+\nu}\cdot(a/r)^3\right]$	$-P\left[1-\dfrac{1-2\nu}{1+\nu}\cdot(a/r)^3\right]$	$(G/K)\ .\ P$
III. Elastic inclusion	Hahn and Rosenfield (1966)	—	—	$(P/3)\left[\dfrac{(K-K_i)}{K_i}\right]$ †
	Present calculation	$-P\dfrac{3E_i(1-\nu)}{(1+\nu)E_i+2(1-2\nu_i)E}$ at $r=a$	$-P\dfrac{3\nu E_i+3(1-2\nu_i)E}{(1+\nu)E_i+2(1-2\nu_i)E}$ at $r=a$	$\dfrac{3PG}{K}\left[\dfrac{K-K_i}{3K_i+4G}\right]$

† Note: τ_{max} in Hahn and Rosenfield's equation goes to infinity as $K_i \to 0$.

$-P$: External hydrostatic pressure,
ν, ν_i: Poisson's ratio of the matrix and inclusion, respectively,
K, K_i: Bulk modulus of the matrix and inclusion, respectively,
($-P_i$): Internal pressure,
r: Radius vector,
τ_{max}: Maximum shear stress,
σ_{rr}, $\sigma_{\theta\theta}$, $\sigma_{\phi\phi}$: Radial, circumferential and azimuthal stress, respectively,
a: The radius of the inclusion,
G: Shear modulus of the matrix,
E, E_i: Young's modulus of the matrix and inclusion, respectively.

Table 2. Calculated stress τ_{max} at spherical cavity, rigid [illegible]
and copper matrix as a function of the applied hydrostatic pressure

τ_{max} (p.s.i.)

Elastic inclusion‡