Interfacial cracking in a graded coating/substrate system loaded by a frictional sliding flat punch

- Electronic supplementary material -
(Figure 7-13)

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Figure 7. Variations of punch-edge stress intensity factors (a) $K_T/K_{0T}$ and (b) $K_L/K_{0L}$ versus punch location $e/c$ for different values of interlayer thickness $h_2/h$ and shear modulus ratio $\mu_1/\mu_3$ ($h/c=1.0$, $\delta/c=0.5$, $\mu_f=0.5$, $K_{0T}=\sigma_0(2\delta)^{-\omega}$, $K_{0L}=\sigma_0(2\delta)^{-\chi}$, $\sigma_0=P/2\delta$).
Figure 8. Variations of crack-tip stress intensity factors (a) $K_I(-c)/K_0$, (b) $K_I(+c)/K_0$, (c) $K_{II}(-c)/K_0$, and (d) $K_{II}(+c)/K_0$ versus punch location $e/c$ for different values of coating thickness $h_1/c (\mu_1/\mu_3=5.0, \mu_f=0.5, h_2/c=0.5, \delta e=0.5, K_0=\sigma_0 c^{1/2}, \sigma_0=P/2\delta)$.  


Figure 9. Variations of punch-edge stress intensity factors (a) $K_T/K_{0T}$ and (b) $K_L/K_{0L}$ versus punch location $e/c$ for different values of coating thickness $h_1/c$ ($\mu_1/\mu_3=5.0$, $\mu_f=0.5$, $h_2/c=0.5$, $\delta/c=0.5$, $K_{0T}=\sigma_0(2\delta)^{\omega}$, $K_{0L}=\sigma_0(2\delta)^{\chi}$, $\sigma_0=P/2\delta$).
Figure 10. Variations of crack-tip stress intensity factors (a) $K_I(-c)/K_0$, (b) $K_I(+c)/K_0$, (c) $K_{II}(-c)/K_0$, and (d) $K_{II}(+c)/K_0$ versus punch location $e/c$ for different values of punch width $\delta c$ ($\mu_1/\mu_3=5.0$, $\mu_f=0.5$, $h_1/h_2/h=0.5$, $h/c=1.0$, $K_0=\sigma_0\delta c^{1/2}$, $\sigma_0=P/2\delta$).
Figure 11. Variations of punch-edge stress intensity factors (a) $K_T/K_{0T}$ and (b) $K_L/K_{0L}$ versus punch location $e/c$ for different values of punch width $\delta/c$ ($\mu_1/\mu_3=5.0$, $\mu_f=0.5$, $h_1/h=h_2/h=0.5$, $h/c=1.0$, $K_{0T}=\sigma_0(2\delta)^{-\omega}$, $K_{0L}=\sigma_0(2\delta)^{-\chi}$, $\sigma_0=P/2\delta$).
Figure 12. Variations of crack-tip stress intensity factors (a) $K_I(-c)/K_0$, (b) $K_I(+c)/K_0$, (c) $K_{II}(-c)/K_0$, and (d) $K_{II}(+c)/K_0$ versus punch location $e/c$ for different values of friction coefficient $\mu_f$ ($\mu_f/\mu_f=5.0$, $\delta c=0.5$, $h_1/h_2/h=0.5$, $h/c=1.0$, $K_0=\sigma_0c^{1/2}$, $\sigma_0=P/2\delta$).
Figure 13. Variations of punch-edge stress intensity factors (a) $K_T/K_{0T}$ and (b) $K_L/K_{0L}$ versus punch location $e/c$ for different values of friction coefficient $\mu_f$ ($\mu_1/\mu_3=5.0$, $\delta/c=0.5$, $h_1/h_2/h=0.5$, $h/c=1.0$, $K_{0T}=\sigma_0(2\delta)^{-\alpha}$, $K_{0L}=\sigma_0(2\delta)^{-\beta}$, $\sigma_0=P/2\delta$).