

**CYCLIC STRESSES IN AE PISTON SKIRTS UNDER
ISOTHERMAL AND STEADY-STATE CONDITIONS**



| | | AE | | | | |
|---------------------------------|-------------|---------------------|--------------------|-------|-------|-------|
| | Notes | F.E. | nominal | min | max | |
| σ_{min} | 1 | <----- -68.1 -----> | | | | |
| σ_{max} | lift-off | 1 | <----- 7.32 -----> | | | |
| | no lift-off | 1 | <----- 1.77 -----> | | | |
| k_i' | 2 | 96.9 | 83.7 | 45.7 | 121 | |
| k_o' | 2 | 118 | 24.0 | 7.95 | 283 | |
| | | g_o | | | | |
| δ_L | 3 | 7 | 1.999 | 1.403 | 0 | 2.140 |
| | | 9 | 0.157 | 0 | 0 | 0.285 |
| | | 11 | 0 | 0 | 0 | 0 |
| $\sigma_{min},$ isothermal | 4 | 7 | -57.5 | -59.7 | -60.3 | -58.4 |
| | | 9 | -62.1 | -62.9 | -62.0 | -63.4 |
| | | 11 | -66.7 | -66.2 | -63.8 | -68.1 |
| $\sigma_{min},$ steady-state | 4 | 7 | -33.0 | -42.7 | -50.9 | -31.5 |
| | | 9 | -37.6 | -45.9 | -52.7 | -36.6 |
| | | 11 | -42.2 | -49.1 | -54.4 | -41.6 |
| $\sigma_{max},$ steady-state | 5 | 7 | 7.91 | 7.74 | 1.77 | 7.96 |
| | | 9 | 7.37 | 1.77 | 1.77 | 7.40 |
| | | 11 | 1.77 | 1.77 | 1.77 | 1.77 |

all stresses in ksi, g_o and δ_L in mils

Notes:

1. From isothermal finite element calculations of skirt with crown, no gap closure.
2. From finite element calculations and estimates based on experiments.
3. Maximum crown/skirt lift-off distance in mils based on crown/skirt model.
4. From crown/skirt interaction model.
5. Equals σ_{max} with no lift-off if $\delta_L = 0$, adjusted from finite element σ_{max} with lift-off if $\delta_L > 0$ by use of crown/skirt interaction model.

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