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NOMENCLATURE

η	Viscosity(m ² /s)
m	Consistency coefficient (Pa.S ⁿ)
I	Second invariant of strain rate tensor
φ_x	pressure flow factor at x direction
φ_y	pressure flow factor at y direction
\bar{p}	average oil film pressure among friction pairs (Pa)
\bar{h}_f	actual average oil film thickness(m)
φ_s	shear flow factor
F_z	gas tension(N)
F_E	elastic force of piston ring(N)
p_B	ring body back pressure (Pa)
p_1	upper cavity pressure of the position where the piston ring is arranged (Pa)
p_2	lower cavity pressure of the position where the piston ring is arranged (Pa)