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| **Nomenclature** | | | |
|  | Apparent contact area (m2) |  | Elastohydrodynamic pressure-viscosity coefficient (1/Pa) |
|  | Asperity contact area (m2) |  | Eyring shear stress (Pa) |
|  | Average contact pressure (Pa) |  | Film thickness of upper row roller (m) |
|  | Asperity contact pressure (Pa) |  | Film thickness of lower row roller (m) |
|  | Asperity contact load (N) |  | Film thickness in the EHL model (m) |
|  | Asperity density (m-2) |  | Fluid hydrodynamic pressure (Pa) |
| β | Asperity average radius (m) |  | Frequency of sliding velocity (Hz) |
|  | Boundary friction (N) |  | Gravitational acceleration (ms-2) |
|  | Contact force of upper row roller (N) |  | Half width of Hertzian contact (m ) |
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|  | Radial load (N) |  | Relaxation factor |
| C | Radial clearance (m) |  | Viscosity-pressure index |
|  | Deformation (m) |  | Minimum film thickness |
|  | Displacement in x-direction (m) |  |  |
|  | Displacement in y-direction (m) |  |  |
|  | Angular position (rad) |  |  |
|  | Radial Load (N) |  |  |
|  | Velocity (m/s) |  |  |
|  | Acceleration (ms-2) |  |  |
|  | Contact stiffness (N/m) |  |  |
|  | Film thickness (m) |  |  |
|  | Half width of Hertzian contact (m) |  |  |
|  | Reduced radius of contact (m) |  |  |
|  | Reduced radius of contact (m) |  |  |
|  | Equivalent modulus of elasticity (Pa) |  |  |
| *ρ0* | Density in atmospheric pressure (kgm-3) |  |  |
| *ρ* | Density (kgm-3) |  |  |
| *μ* | Dynamic viscosity (Nsm-2) |  |  |
| *μ0* | Dynamic viscosity in atmospheric pressure (Nsm-2) |  |  |
|  | Elastohydrodynamic pressure-viscosity coefficient (1/Pa) |  |  |
|  | Poisson ratio |  |  |
|  | Sliding velocity at contact (m/s) |  |  |
|  | Time (s) |  |  |
|  | Angular velocity (rad/s) |  |  |
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|  | Central film thickness (m) |  | Limiting shear stress (Pa) |
|  | Constant in film thickness equation (m) |  | Maximum Hertzian pressure (Pa) |
|  | Displacement (m) |  | Number of rollers in each row (groove) (m) |
| *ρ0* | Density in atmospheric pressure (kgm-3) |  | Poisson ratio |
| *ρ* | Density (kgm-3) |  | Sum of asperity and fluid pressure (Pa) |
| *μ* | Dynamic viscosity (Nsm-2) |  | Sliding Velocity (m/s) |
| *μ0* | Dynamic viscosity in atmospheric pressure (Nsm-2) | σ | Surface roughness(m) |
|  | Equivalent modulus of elasticity (Pa) |  | Time (s) |
|  | External force (N) |  | Viscosity-pressure index |
|  | Equivalent radius of contact surface (m) |  | Linear guideway natural frequency (Hz) |
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|  | Angular position (rad) |
|  | Pressure viscosity coefficient (m2N-1) |
|  | Contact Deflection (m) |
|  | Average asperity tip radius of curvature (m) |
|  | Stribeck parameter (-) |
|  | Atmospheric lubricant dynamic viscosity (Pa.s) |
|  | Lubricant dynamic viscosity (Pa.s) |
|  | Lubricant density (kg/m3) |
|  | Atmospheric lubricant density (kg/m3) |
|  | Solid density (kg/m3) |
|  | Composite surface roughness (m) |
|  | Boundary shear strength of asperities (Pa) |
|  | Eyring stress (MPa) |
|  | Angular velocity of cage (rad/s) |
|  | Angular velocity of inner race (rad/s) |
|  | Relaxation factor (-) |
|  | Asperity density (m-2) |

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|  | Asperity apparent contact area (m2) |
|  | Apparent contact area (m2) |
|  | Acceleration (m/s2) |
|  | Half length of the contact (mm) |
| C | Radial clearance (µm) |
|  | Solid specific heat capacity (J/kgK) |
|  | Equivalent (reduced) elastic modulus (GPa) |
|  | Radial load in x-direction (N) |
|  | Radial load in y-direction (N) |
|  | Total friction (N) |
|  | Boundary friction (N) |
|  | Viscous friction (N) |
|  | Dimensionless equivalent geometry (-) |
|  | Central film thickness (m) |
|  | Stiffness (N/m) |
|  | Lubricant thermal conductivity (W/mK) |
|  | Roller length (mm) |
|  | Exponent of localized deflection (-) |
|  | Contact pressure (GPa) |
|  | Average pressure at the apparent contact (Pa) |
|  | Radius of inner race (mm) |
|  | Equivalent radius of contact (mm) |
|  | Speed of entraining motion (m/s) |
|  | Dimensionless speed parameter (-) |
|  | Velocity (m/s) |
|  | Contact load (N) |
|  | Dimensionless load parameter (-) |
|  | Asperity load (N) |
|  | Displacement in x-direction (µm) |
|  | Displacement in y-direction (µm) |