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Figure 2. Scheme design of the journal bearing with the embedded heat pipe
(a) The inner ring of the isothermal journal bearing.
(b) The outer ring of the isothermal journal bearing.
(c) The solid ring of the isothermal journal bearing.

Figure 3. Experimental apparatus for the experimental investigation of the thermal performance of the new journal bearing.

Figure 4. Comparison of the steady-state circumferential temperature distributions of the isothermal journal bearing and the conventional journal bearing at a power input of 32.7W.
($T_0=21^0C$, with fan on, $V_m=2.5ml$)
(a) Temperature distribution along the inner ring of the bearing.
(b) Temperature distribution along the outer ring of the bearing.

Figure 5. Comparison of the maximum and minimum temperatures of the isothermal journal bearing with those of the conventional journal bearing under different heat inputs. ($T_0=21^0C$, $V_m=2.5ml$)
(a) Steady state with fan off.
(b) Steady state with fan on.
(c) At $t=3$min. with the fan on.

Figure 6. Comparison of the maximum and minimum temperatures of the isothermal journal bearing with those of the conventional journal bearing as a function of time with the fan on.
(Power=32.7W, $T_0=21^0C$, $V_m=2.5ml$)

Figure 7. Comparison of the maximum and minimum temperatures of the isothermal journal bearing with those of the conventional journal bearing under different angle $\beta$ with the fan off. (Power=12.5W, $T_0=21^0C$, $V_m=3.5ml$)
Figure 8. Comparison of the maximum and minimum temperatures of the isothermal journal bearing with those of the conventional journal bearing at steady state as affected by the heater position under different angle $\gamma$ with the fan off. (Power=12.5W, $T_0=21^0C$, $V_m=3.5ml$)

Figure 9. Comparison of the maximum and minimum temperatures of the isothermal journal bearings as affected by the liquid volume at steady state with the fan off. (Power=12.5W, $T_0=21^0C$)

Figure 10. Temperature difference ($\Delta T=T_{max}-T_{min}$) comparison for two Stainless-steel bearings having different diameters at steady state with fan off. (Power=12.5W, $T_0=21^0C$, Heater=25.4 mm$^2$, bearing #1: $\Phi 105mm$, bearing #2: $\Phi 50mm$)
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Table 1. Bearing geometry

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