Wear of sliding parts and operational machine consistency enhancement can be avoided with good lubrication. Lubrication reduce wear between two contacting and sliding surfaces and decrease the frictional power losses in compressor. The coefficient of friction and wear rate effects study were carried out to measure the friction and anti-wear abilities of Al2O3-SiO2 composite nanolubricants a new type of compressor lubricant to enhanced the compressor performances. The tribology test rig employing reciprocating test conditions to replicate a piston ring contact in the compressor was used to measure the coefficient of friction and wear rate. Coefficient of friction and wear rate effects of different Al2O3-SiO2/PAG composite nanolubricants of Aluminium 2024 plate for 10-kg load at different speed were investigated. Al2O3 and SiO2 nanoparticles were dispersed in the Polyalkylene Glycol (PAG 46) lubricant using two-steps method of preparation. The result shows that the coefficient friction and wear rate of composite nanolubricants decreased compared to pure lubricant. The maximum reduction achievement for friction of coefficient and wear rate by Al2O3-SiO2 composite nanolubricants by 4.78% and 12.96% with 0.06% volume concentration. Therefore, 0.06% volume concentration is selected as the most enhanced composite nanolubricants with effective coefficient of friction and wear rate reduction compared to other volume concentrations. Thus, it is recommended to be used as the compressor lubrication to enhanced compressor performances.