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| Sommario/riassunto | This thesis investigates the tribological viability of bio-based base stock to which different nanoparticles were incorporated for engine piston-ring–cylinder-liner interaction. It determines experimentally the effects of lubricating oil conditions (new and engine-aged) on the friction and wear of the materials used for piston rings and cylinder liners. The specific base stock examined was a trimethylolpropane (TMP) ester derived from palm oil, and the nanoparticles were used as additives to obtain tribologically enhanced bio-based lubricants. The overall analysis of the results demonstrated the potential of |

nanoparticles to improve the tribological behavior of bio-based base stock for piston-ring–cylinder-liner interaction.