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Sommario/riassunto	<p>Electrical contacts in automotive applications are exposed to thermal and vibration induced relative motion in the tribological contact. Fretting tests with an AuCo/Ni vs. Au/NiP ball to plate contact were conducted in order to describe the ongoing wear mechanisms. Furthermore, a global wear approach was chosen to quantify the overall wear. According to a predefined electrical failure criterion the connector lifetime is demonstrated in a model depending on oscillating amplitude, gold thickness and contact roughness. The electrical failure of the contact can be reduced to the wear of the gold platings leading to exposure of the nickel interlayer and consequently oxidation. Through material transfer, plowing, particle generation and the particle transport mechanisms the contact resistance increases and therefore limits the connector lifetime. The link between the lifetime models and the global wear approach allows for calculation of the lifetime when only the wear and the stress of the tribosystem are known.</p>