

## INFLUENCE OF SLIDE-ROLL RATIO ON MICROPITTING / MACROPITTING UNDER HIGH LOAD AND HIGH SPEED ROLLING FRICTION TEST

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### KEYWORDS

*Rolling contact fatigue; Wear; Friction; Micro/ Macro Pitting*

### ABSTRACT

The e-axle as a transmission/motor system in electric vehicles is becoming an alternative to traditional engines. In the development of the e-axle, increasing the rotation speed of the motor and improving the efficiency of the transmission are urgent issues in order to make the system more compact. The high speed rotation of the transmission and the resulting low viscosity of the lubricating oil affect the poor lubrication of the gear and bearing surfaces and the increase of pitting wear. Pitching wear causes transmission vibration and noise, and reduces powertrain efficiency and life.

In this research, using a three-roller pitting wear tester that enables higher speed (>4.0m/s) and higher load (>2000N) testing from Rtec-Instruments (fig.1), we investigated the effect of the slip ratio on the occurrence and progression of micro-pitting on the rolling friction surface of gear steel.

We investigated micropitting size, depth and shapes of cross section for each SRR value (Fig.2), and the duration until macropitting was happened for each SRR by AE sensor (Fig.3).

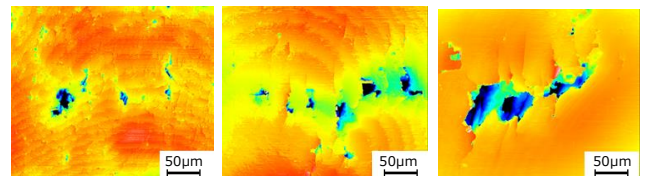


Fig.2 Micropitting surface profiling (SRR=-0.5%, -2%, -5%)

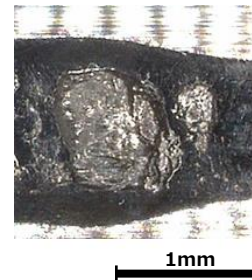


Fig.3 Macropitting surface profiling (SRR=-5%)

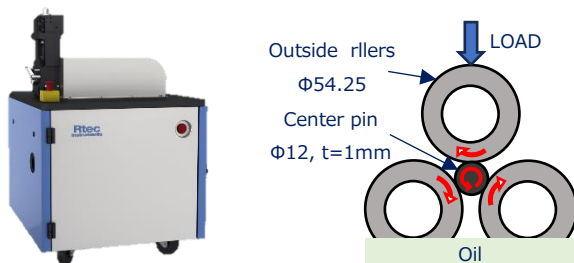


Fig.1 Three-roller pitting wear tester (MPT-3000)

### REFERENCES

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