

Appendix A: Comparison of the wear rates achieved within the four different tribosystems, reminder of the wear sequence and mechanisms using Al_2O_3 as counter-body, and highlighting of macro and micro scale characterizations for the reference test performed on DEDed 316L+WC MMC against 440C counter-body

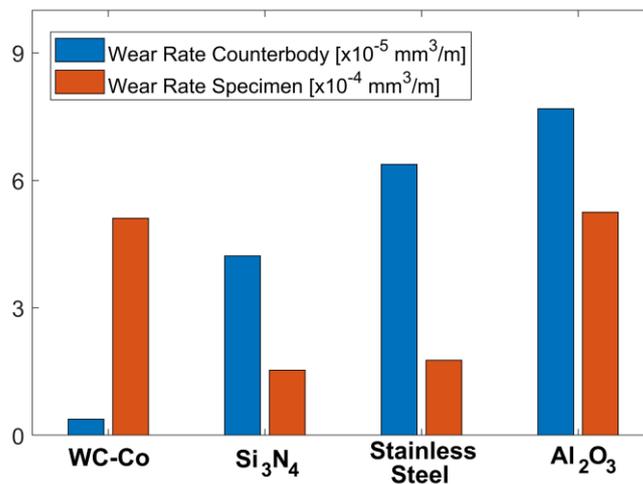


Fig. A.1 : Comparison of wear rates (WR) achieved on the DEDed 316L+WC specimen against the four different counter-bodies after reference tests up to 22,000 laps.

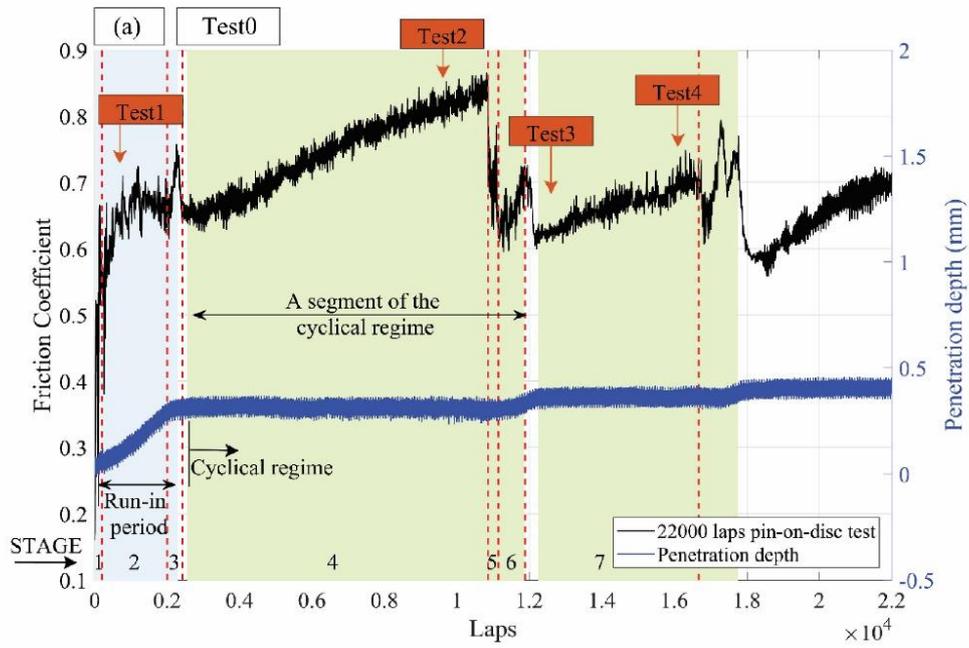


Fig. A.2 : Evolution of both the Coefficient of Friction (CoF) and the Penetration Depth (PDe) of the DEDed 316L+WC MMC sliding against Al_2O_3 during the reference test of 22,000 laps (from [18]). After an initial run-in, a cyclical regime is present.

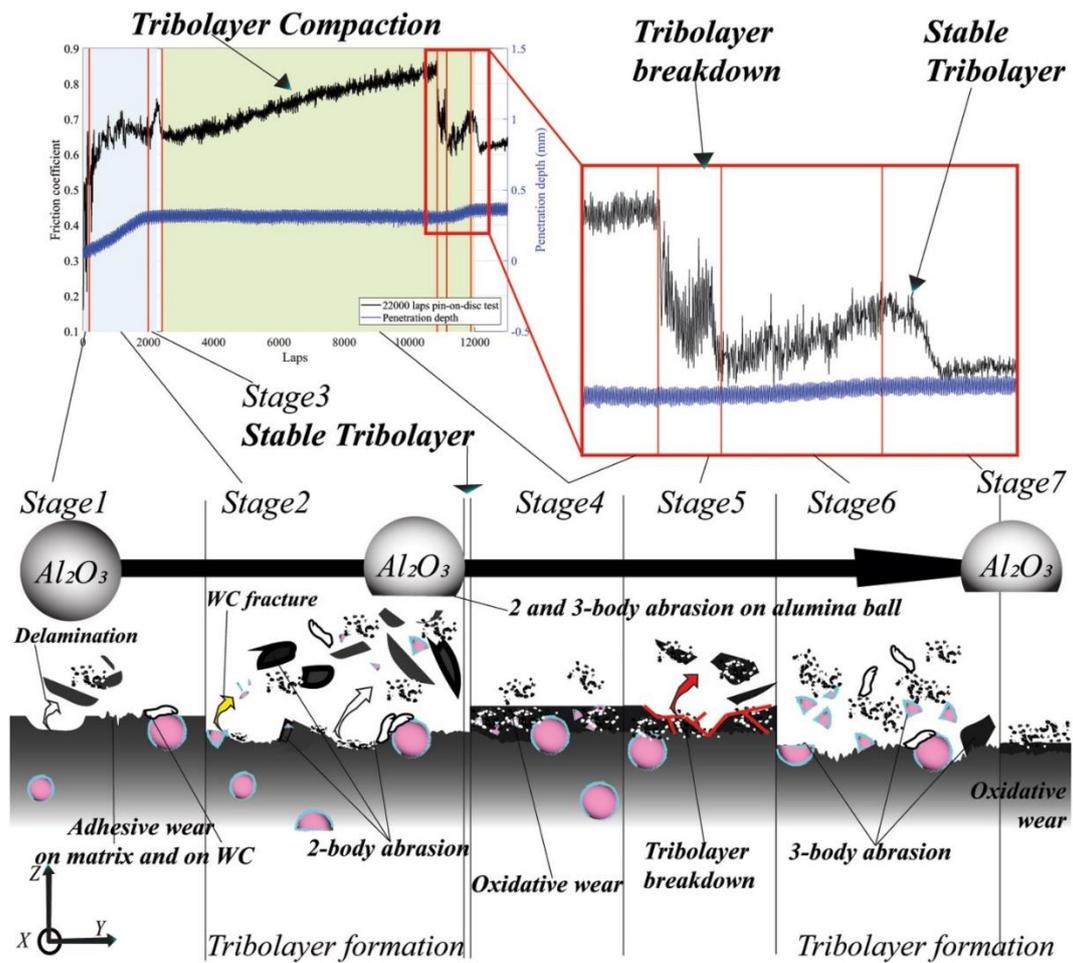


Fig. A.3 : Sketch of the wear sequence of the DEDed 316L+WC MMC against Al_2O_3 with the enhancement of wear mechanisms related to each stage (from [18]).

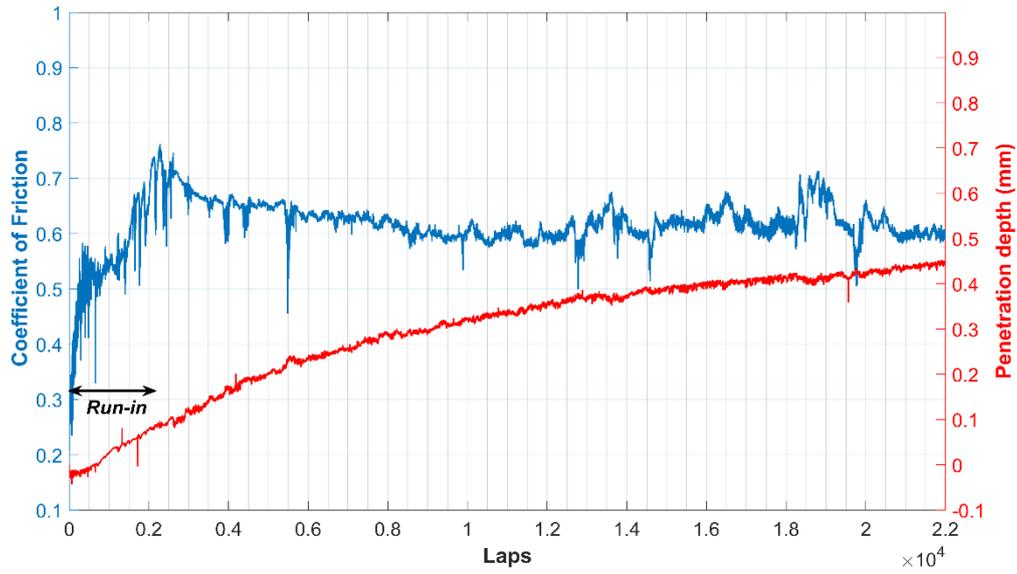


Fig. A.4 : Evolution of the both the Coefficient of Friction (CoF) and the Penetration Depth (PDe) of the DEDed 316L+WC MMC sliding against 440C recorded during pin-on-disc tests. The run-in period is highlighted (up to 2000 laps), followed by a steady state regime made of a quasi-constant CoF that lasts upon 22,000 laps; the cyclical trend (cyclical segments) observed with ceramics-based counter-bodies is no more present with the 440C.

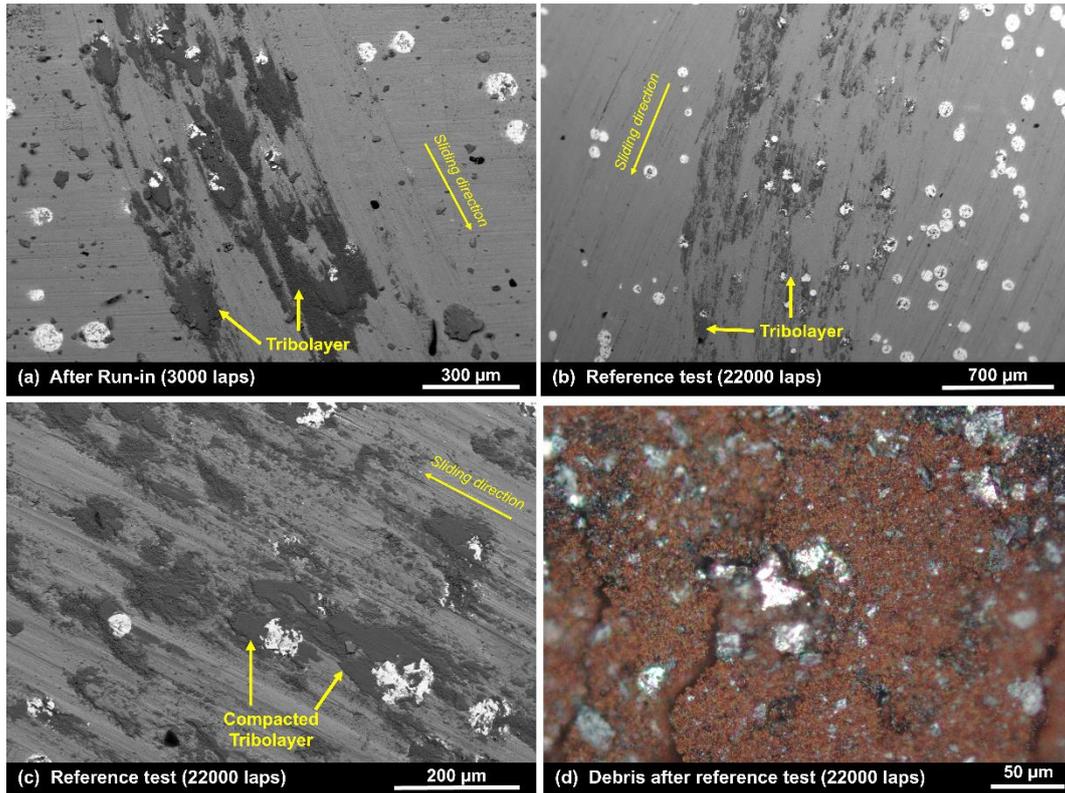


Fig. A.5 : Evolution of the worn surface of the composite sliding against 440C, referring to changes in the CoF (Fig. A4). Appearance of a stable tribolayer after the end of the run-in (a). Presence of a homogeneous tribolayer after the whole reference test (b) with low compaction (c). Overview of the brownish red debris generated during the reference tests (d).

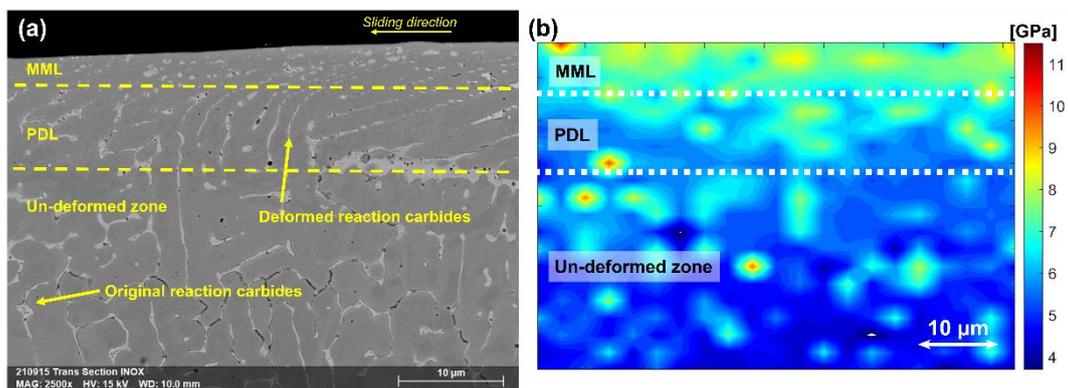


Fig. A.6 : Friction-induced layers generated during the reference test (a) and their nano-hardness map (b) when considering DEDED 316L+WC sliding against 440C counter-body. The depth of MML and PDL varies between 4-5 μ m and 7-8 μ m respectively.