

5.2.1.5 Nimonic 80A versus Stellite 6 – Oxide build-up at room temperature and 630°C, 0.314 m.s⁻¹

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Continuous observation of the 0.314 m.s⁻¹/4,522 m test at room temperature (this prompted by the 750°C experimental data) showed an apparently instantaneous generation of oxide debris, again with only a little damage to counterface or sample, largely restricted to the early stages of wear. Weight change and wear rate values after 2 minutes / 38 m and 10 minutes / 188 m were negligible. After 4,522 m / 240 minutes of sliding, a mean weight change of -0.002(8) g indicated only a very small loss due to sliding.

Additional one off tests at 630°C for 2 minutes (37 metres – weight change = 0.00166 g) and 10 minutes (188 metres – weight change = 0.00149 g) indicated equally rapid glaze formation at this lower temperature (Figure 5.16). The weight change after 4 hours (4,522 m) of sliding was 0.00144 g – the pattern of rapid early glaze formation followed by little subsequent change in weight and a spreading of the glaze across the wear surface was repeated.

Figure 5.A1: Weight change versus sliding distance – Nimonic 80A versus Stellite 6 (510°C, 630°C and 750°C)

