CORROSION DATA FOR STELLITE® 6 AND STELLITE® HS-6 WITH EMPHASIS ON SALT WATER ENVIRONMENTS

1. Free corrosion potential

The free corrosion potential of Stellite® 6 under standard conditions is approximately -0.25mV.

2. Polarisation curves in sea water

These have been recently generated for both cast and hipped Stellite® 6 by Professor Anne Neville of Leeds University. The experimental procedure is shown schematically below, along with examples of typical active and passive polarization curves.

Experimental Procedure:

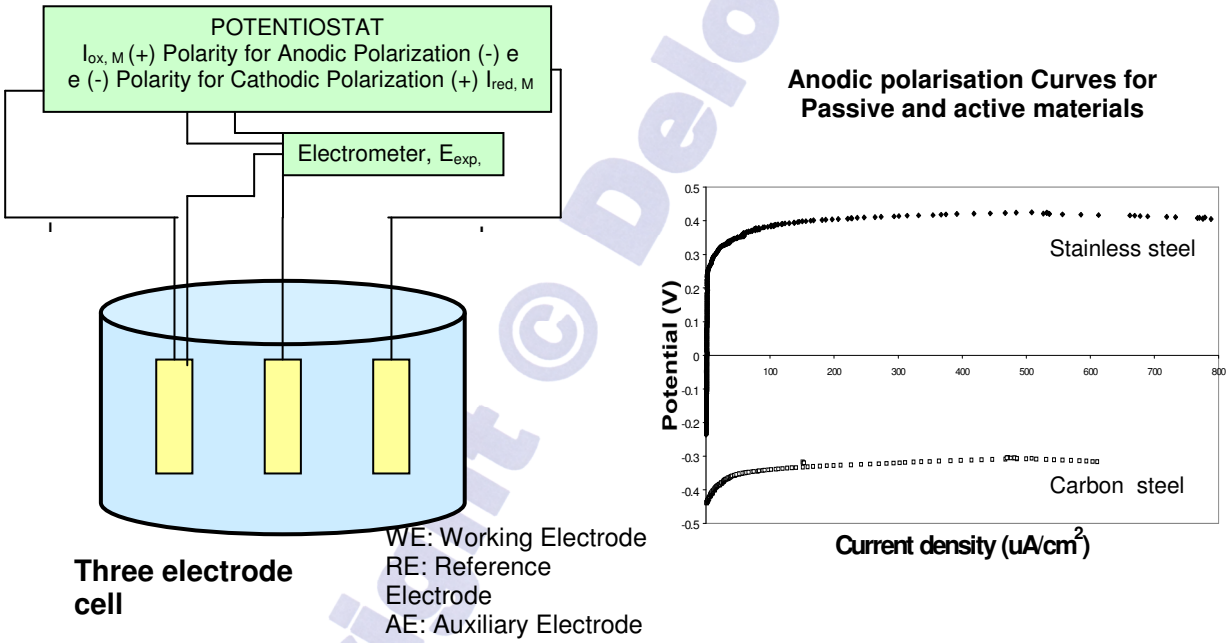

Figure 1: Experimental Procedure Followed by Leeds University

The results of these tests, which were conducted at several different temperatures, are presented below in **Figures 2 to 6**. The breakdown potential drops as the temperature rises, i.e. the passive region becomes smaller. HIP-consolidated Stellite® 6 (from powder form) performs better than cast Stellite® 6, probably due to its more homogeneous and finer microstructure.

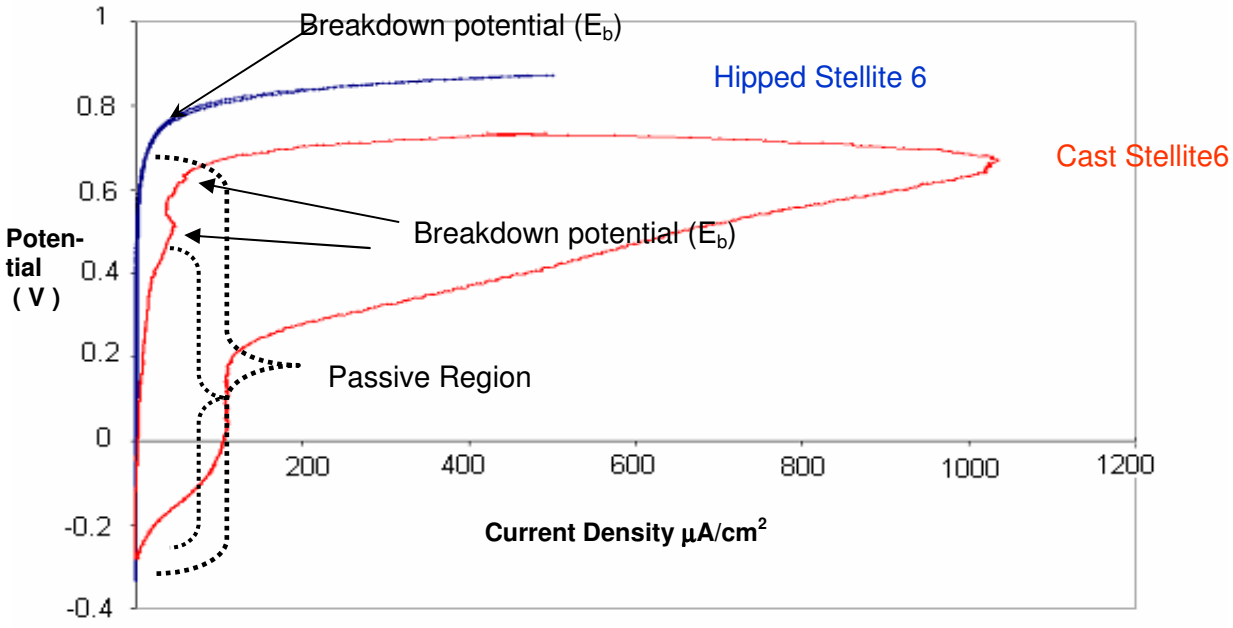

Figure 2: Anodic polarisation of HIP'ed and cast Stellite® 6 at 20˚C in 3.5% NaCl Solution

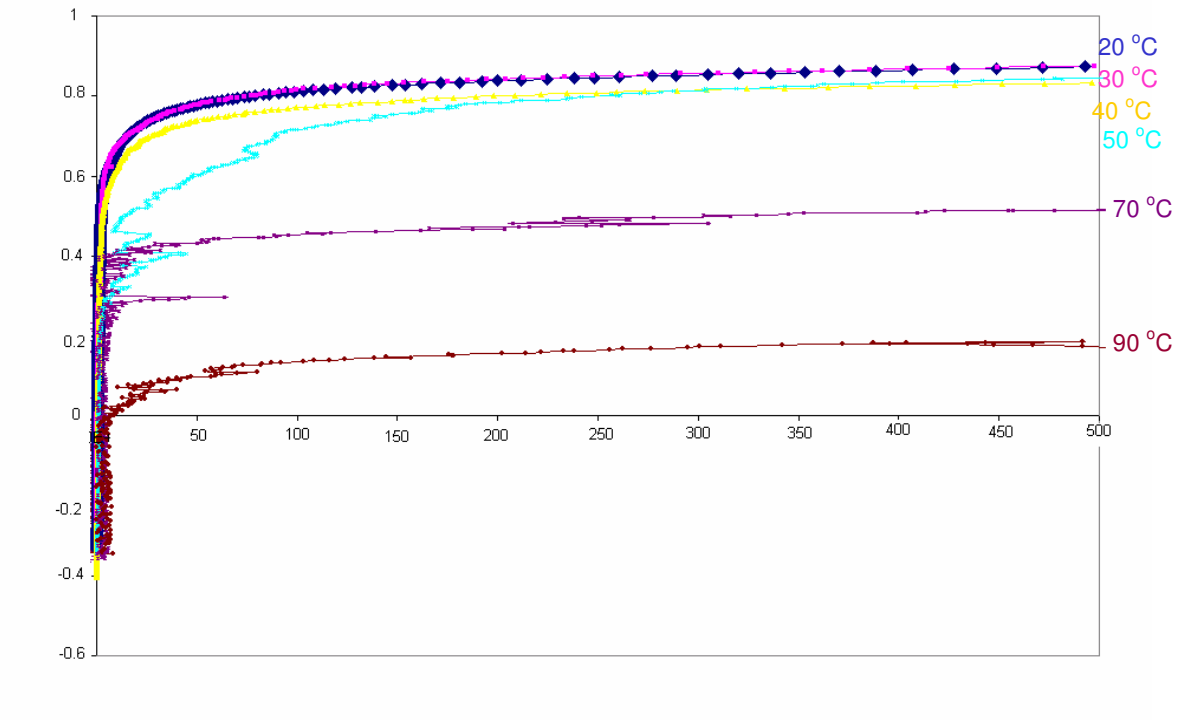

Figure 3: Anodic polarisation of HIP'ed Stellite® 6 at different temperatures in 3.5 % NaCl

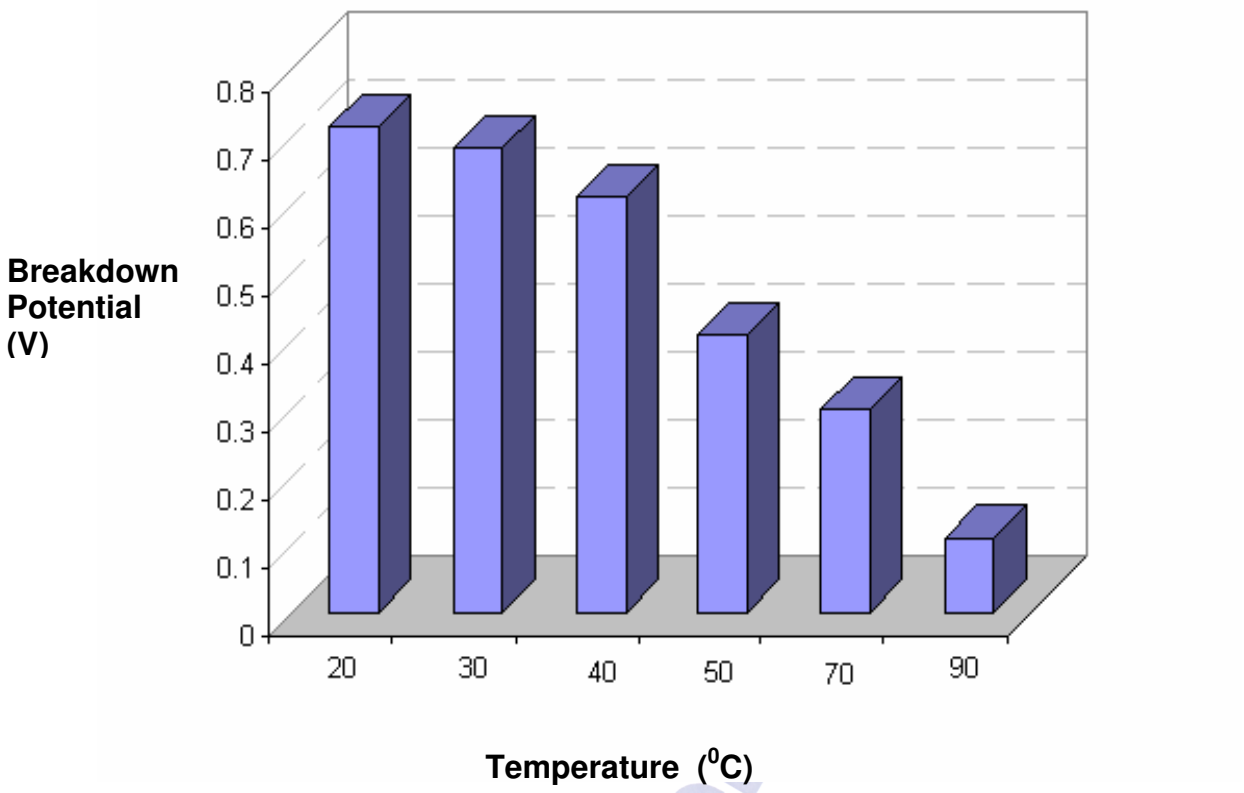

Figure 4: Breakdown potential of HIP'ed Stellite® 6 as a function of temperature

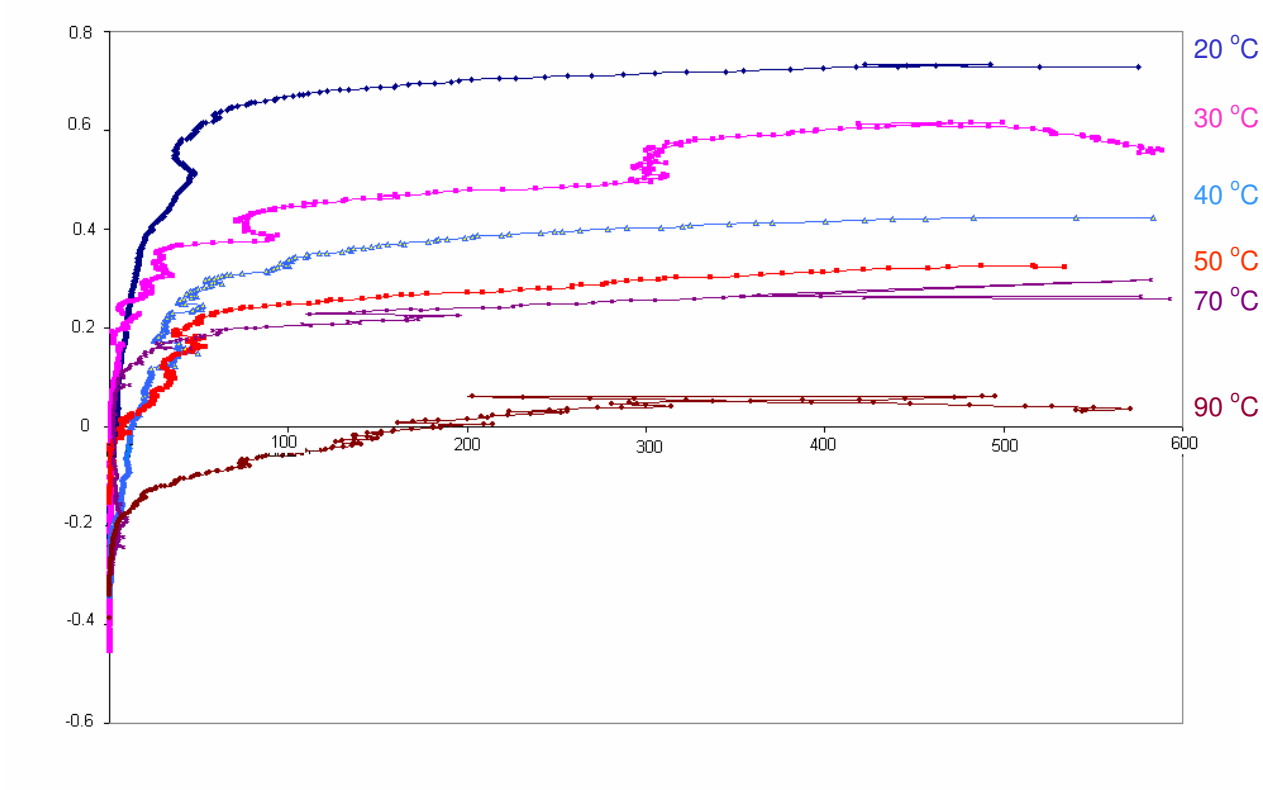

Figure 5: Anodic polarisation of cast Stellite® 6 at different temperatures in 3.5 % NaCl

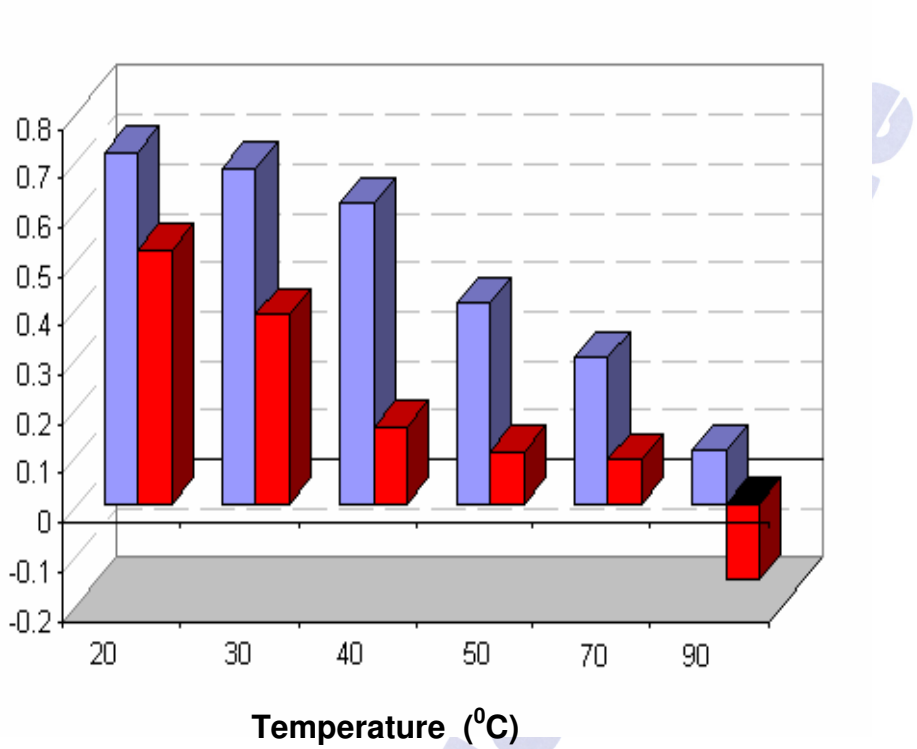

Figure 6: Comparison of the breakdown potential of cast (red) and HIP'ed (blue) Stellite® 6 as a function of temperature.

3. Mass loss in sea water

Stellite alloys, like most materials, corrode locally and not generally in seawater. Stellite® 6 mass loss in sea water is below 0.05mm per year at 22˚C.

4. Other corrosion data for Stellite® 6

Mass loss data is available on request for a wide range of acid solutions, as well as cupric chloride, ferric chloride, ASTMG28A tests and ASTM G28B tests.

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