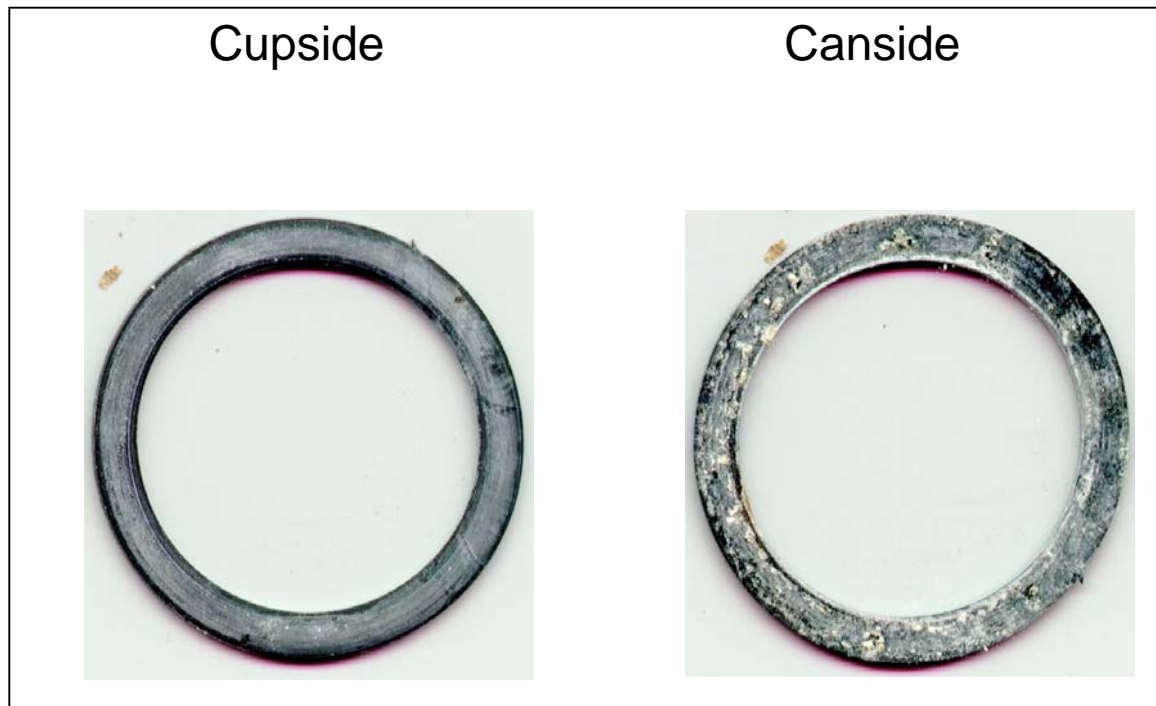


CASE STUDY 10 - Development of Aerosol corrosion test

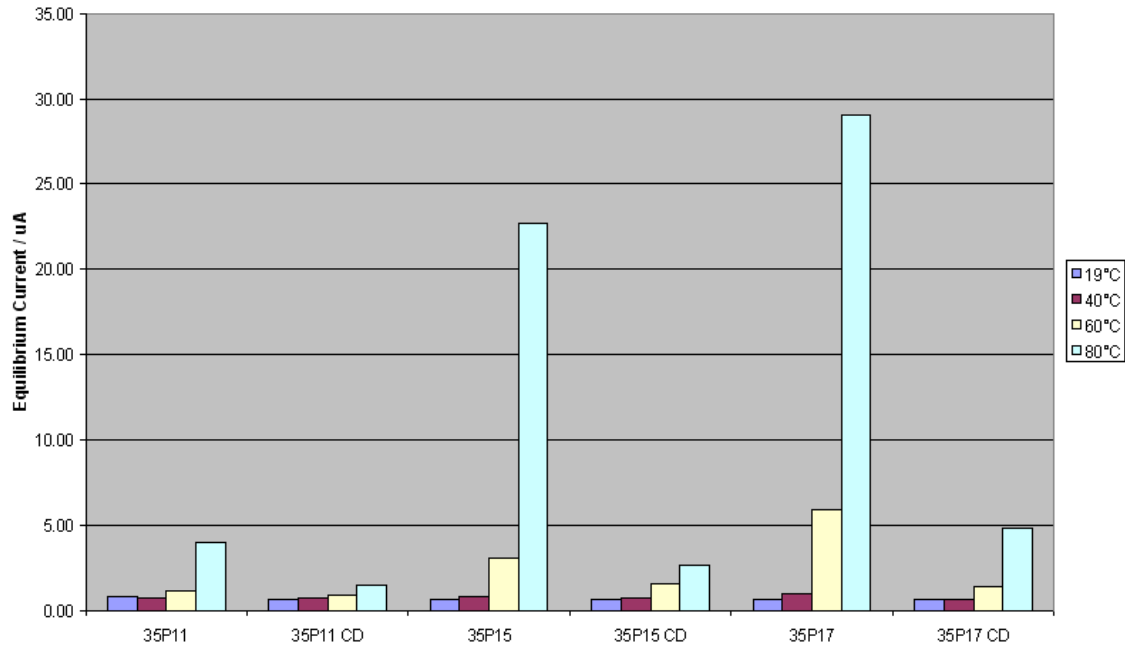
Brief

The phenomena known as “Cupseal Corrosion” is usually a combination of Galvanic activity and crevice corrosion exacerbated by the extraction of chemical species from the rubber. It can lead to deposits on the can bead and seal formed from the corrosion products



Galvanic effects can be measured using sensitive equipment to detect the small currents generated from a cell containing appropriate electrodes and using zero impedance Amperometry. ARTIS developed a test cell to measure this response and the UK National Physical Laboratory validated the Avon test methodology. The Electrochemical activity produces a small current, which can degrade the rubber as well as the aluminium. These currents can be as low as several nanoAmps or up to several milliAmps. With the right equipment very small currents can be measured over time and temperature ranges to determine the activity of the materials. Arrhenius type relationships can then be used to determine the sensitivity.

Zero impedance ammeter testing
0.5molar NaCl



Effect of "anti-Galvanic" filler systems (CD)

The Equilibrium currents are measured at different temperatures and the sensitivity compared. High temperature dependence suggests high activity. By using very special filler systems it is possible to reduce galvanic effects to a minimum in a wide range of compounds.