

GeoWell – Corrosion Testing of Materials in Geothermal Steam

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It is of high importance for long life of geothermal wells to select casing materials that can both withstand the high temperature and the corrosive nature of the geothermal fluid. Material selection for geothermal wells is adopted from the oil and gas industry and is based on API (American Petroleum Institute) and NACE (National Association of Corrosion Engineers) standards and guidelines. Most common casing materials are low carbon grades. However, the aggressive corrosive environment of deep high-enthalpy sources calls for more corrosion resistant materials. Cladded materials consisting of low cost base material and a corrosion resistant cladding layer (~3 mm) are an attractive alternative to expensive full thickness corrosion resistant alloys (CRA). In the GeoWell project, various cladding material combinations were put in direct contact with geothermal steam at ~250 °C. The effect of temperature on the corrosion mechanism was tested in parallel with the same set of materials at elevated temperatures where the steam was heated to ~450 °C.