

Quantitative and Qualitative Analysis of Crevice Corrosion
Using Confocal Laser Scanning Microscopy

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Artificially creviced Alloy 22 samples which were corroded by Mon, Gordon, and Rebak¹ at constant potential were studied using a confocal scanning laser microscope (CLSM). Qualitative and quantitative measurements of crevice damage were obtained for specimens exposed to different environment/potential combinations. On each sample there were twenty-four crevice sites which were created with multiple crevice assembly washers. Crevice sites which included only base metal, only weld metal, and a mixture of base and weld metal were analyzed. Qualitatively, it was found that the individual crevices exhibited morphologies characteristic of classic crevice corrosion, intergranular crevice corrosion, or a combination of both. Quantitatively, measurements of volume removed per crevice site as well as the maximum depth of corrosion attack were made. Results of these analyses and their implications to crevice corrosion mechanisms will be reported.

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Reference:

1. K. Mon, G. Gordon, R. Rebak, "Stifling of Crevice Corrosion in Alloy 22." 12th International Conference on Environmental Degradation of Materials in Nuclear Systems-Water Reactors, Salt Lake City, UT, 8/14/05-8/18/05