

PRE-EXPOSURE EMBRITTLEMENT OF SENSITIZED ALUMINIUM-MAGNESIUM ALLOY, 5083-H131

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Environment-sensitive fracture of aluminum-magnesium alloys containing above ~3 wt% magnesium historically has been considered under anodic-dissolution control. Information from more recent studies, however, suggests a hydrogen-related process is also often involved. Further evidence supporting the involvement of a hydrogen-related process during intergranular stress corrosion cracking (IGSCC) will be presented using information gleaned from smooth and pre-cracked test specimens, previously sensitized over a range of temperatures in both 'dry' and 'wet' conditions and then subjected to rising-load testing in a range of environments. A detailed evaluation of the IGSCC using X-ray computed tomography to provide 3-D images and ultra-high-resolution electron microscopy to characterize selected regions within intergranular stress corrosion cracks enables mechanistic insights.