Plastic Failure LABS

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Do Cement Drips Cause CPVC Pipes to Fail?

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Introduction

One of the current debates among CPVC pipe Forensic Scientists is over whether CPVC solvent cement drips are the root cause of some CPVC pipe failures. Fabio Castellani[1] of Weld-On Corporation (a leading manufacturer of CPVC cement) and Alan Lunt[2] of Spears (a leading manufacturer of CPVC pipes and fittings) have expressed opinions.[1,2] that cement drips do not cause CPVC pipes to fail. Generally when cracks form next to cement dribbles (as shown in Figure 1), fracture surface analysis reveals a failure mode that is consistent with environmental stress cracking (ESC). In order for ESC to occur there must be two simultaneous events; i.e., stress and the presence of an incompatible chemical.[3-5] Is the cement drip an incompatible chemical or a stressor? Certainly a cement drip is not an incompatible chemical because cement is present in all CPVC fitting assemblies. If cement was incompatible with CPVC, every fitting would fail. The purpose of the current investigation is to explore the effects of cement drips on the chemical resistance of CPVC to determine if drips facilitate ESC failure to occur when mildly incompatible chemicals are present in the piping system.

Figure 1. Incipient ESC cracking is apparent as a halo around the perimeter of a cement drip.