DEMONSTRATION OBJECTIVE

The ElectroStrip™ was demonstrated at FIU-HCET in April 1999 by EMEC Corporation. The objective of the demonstration was to remove coatings or rust from carbon steel plates and I-beams.

TECHNOLOGY DESCRIPTION

The ElectroStrip™ process is designed to remove paint from steel structures. Debonding of the coating is achieved by applying a cathodic current to a painted metal substrate. The environmentally benign electrolyte is contained in a liquid-absorbent material to which a counter electrode is attached. This combination, often with a liner, is applied to the painted metal surface, in the case of steel, with magnets. To initiate current flow, a surface that is not sufficiently deteriorated needs to be scored. After an electrochemical treatment for ½ to 2 hours at a safe voltage of 8 to 10 V, the ElectroPad is removed, and paint fragments are collected. Banks of ElectroPads may cover an area up to 150 square feet and can be run simultaneously. Pads can accommodate various sizes and geometries (e.g., rounded surfaces).

RESULTS

During the demonstration, the coated plates and I-beams were scored before operators manually covered them with ElectroPad. The electrochemical treatment was approximately 1.5 hours for the coated plates, and 1 hour for rusted plates, coated I-beams and rusted I-beams. Operators occasionally sprayed the electrolyte onto the pad during the waiting time.

The technology was successful in removing rust from rusted plates with a production rate of 29 ft²/hr. Demonstration for coating removal on the painted plates presented inconsistent results. Paint was completely removed from 1 of the 6 plates, and partially removed from the rest. The production rate was approximately 8 ft²/hr. The technology was able to remove majority of the paint and rust from the coated and rusted I-beams with a production rate of 20 and 18 ft²/hr respectively.

The technology required modest equipment setup. No aggressive chemicals were used, and no airborne particles were generated. The technology also had a low noise level.

The technology was designed to remove lead based alkyd-type coatings. The demonstration suggested that technology was effective on flat surfaces with paint responding to the localized alkaline condition created, in this case, an anti-corrosive paint. It is less effective on irregular shaped surfaces. Operation parameters need to be redefined to achieve good results for epoxy paint removal.

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