

SECTION 6 - TECHNOLOGY SAFETY DATA SHEET

TECHNOLOGY SAFETY DATA SHEET
ElectroStrip™

SECTION 1: TECHNOLOGY IDENTITY	
<p>Manufacturer's Name and Address:</p> <p>ElectroStrip Corporation 4221 Roundtop Road Export, PA 15632</p>	<p>Emergency Contact:</p> <p>Dr. Rudolf Keller (724)-335-8402</p> <p>Information Contact:</p> <p>Dr. Rudolf Keller (724)-335-8402</p> <p>Date Prepared:</p> <p align="center">February 2001</p>
<p>Other Names:</p> <p>None.</p>	<p>Signature of Preparer:</p> <p>Operating Engineers National Hazmat Program 1293 Airport Road, Beaver, WV 25813, phone 304-253-8674, fax 304-253-1384</p> <p>Under cooperative agreement DE-FC21-95 MC 32260</p>

SECTION 2: PROCESS DESCRIPTION

In the ElectroStrip™ method, a cathodic current is applied to a painted metal substrate, to achieve debonding of the coating. The electrolyte is contained in a liquid-absorbent material to which a counter electrode is attached. This combination, often combined with a liner, is applied to the painted metal surface, in the case of steel with magnets. To initiate current flow, a not sufficiently deteriorated surface needs to be scored. After electrochemical treatment of ½ to 2 hours at a voltage of 8 to 10 V, the ElectroPad™ is removed and paint fragments are recovered.

The following are the process steps for the practical (commercial) application of the ElectroStrip™ concept.

- Preparation of ElectroPads™ - Pads are assembled at EMEC Consultants facilities or on site. They are placed in a plastic container and electrolyte added. By agitating the container, the liquid is distributed to all areas of the pads.
- Scoring of Surface - Surfaces with a painted coating are scored to allow passage of current, unless the coating is sufficiently deteriorated. Large flat areas of a surface are scored with a mechanical rotary tool, preferably equipped with a specially arranged set of star wheel cutters. One pass by the hand tool is sufficient if care is taken that the scoring is thorough enough to penetrate the entire paint coating down to the metal. Less accessible parts of the surface can be scored with a needle gun or scratched with a carbide-tipped hand tool.
- Placement of ElectroPads™ - ElectroPads™ are hand-placed. Shorting with the structure, e.g., in corners is to be avoided. Electrical connections are made to extensions of the Exmet screen of neighboring pad pairs.
- Application of Electrical Current - Current is initiated at the rectifier. It can be interrupted automatically after a preset time. Voltage adjustments are made as required. While the current raises the temperature of the pads and the substrate, excessive evaporation of liquid must be avoided. If excursions to abnormally high temperatures occur, e.g., due to shorting, pads are disconnected.
- Moistening of Pads During Treatment - Every 15 to 20 minutes pads are sprayed with electrolyte to avoid any drying out.
- Removal of ElectroPads™ - After automatic interruption of the current, pads are removed and collected.
- Scraping, Cleaning and Washing Surface - The de-bonded paint is collected with the spent pads. Loose paint adhering to the steel surface is hand scraped and collected with a vacuum. The surface then can be cleaned with wet paper towels, to be collected with the spent pads. After completion of the process, the surface can be washed at high-pressure with a Recycleclean™ unit; this has been shown to remove electrolyte salt (e.g. sodium sulfate) to a low concentration level.
- Complete Paint Removal With Hand Tools - Paint remnants that are not removed by the ElectroStrip™ treatment can be removed using hand tools.

SECTION 3: TECHNOLOGY PICTURES

Process diagrams are not available. See manufacturer to obtain.



Electricity is routed from the rectifier (left) to bus bar (pictured on the left side of the right picture). Electrical leads are run from the bus bar and attached to the wire mesh inside the pads. The pads are held in place by magnets. Periodically the pads are sprayed with electrolyte to prevent overheating.

SECTION 4: CONTAMINANTS AND MEDIA

The ElectroStrip™ operation creates a minimum amount of dust because it is a debonding process rather than a blasting process. The waste generated is liquid. The waste is created from the run off of spraying the pads and the cleaning of the surface, after the debonding, with a vacuum high-pressure sprayer.

SECTION 5: ASSOCIATED SAFETY HAZARDS

Probability of Occurrence of Hazard:

- 1 Hazard may be present but not expected over background level
- 2 Some level of hazard above background level known to be present
- 3 High hazard potential
- 4 Potential for imminent danger to life and health

A. ELECTRICAL (LOCKOUT/TAGOUT)**RISK RATING:4**

Grounding the rectifier and generator is an issue. Both the generator and rectifier need to be grounded with the proper grounding techniques and wiring and tested to ensure they are grounded. There is a definite need for a Lockout/Tagout program. Wires throughout the process need to be up to code. Jewelry, which can be a very good conductor, should be prohibited when working around the process.

B. FIRE AND EXPLOSION**RISK RATING: 3**

Sparks were present which is an ignition source. Heat was created which is another ignition source.

C. CONFINED SPACE ENTRY**RISK RATING: N/A**

If this technology is used in a confined space then all hazards associated with a confined space will apply. This technology would create ignition sources, which should be taken into account when considering confined space use.

D. MECHANICAL HAZARDS**RISK RATING: 1**

No moving parts.

E. PRESSURE HAZARDS**RISK RATING: 1**

As far as the technology itself there were no pressure hazards. There are, however, minor pressure hazards associated with the use of the vacuum pressure washer.

F. TRIPPING AND FALLING**RISK RATING: 3**

There are numerous wires and cables involved in the process. Electrical leads run from the bus bar and attached to the wire mesh inside each pad. Wires and cables should be bundled together.

G. LADDERS AND PLATFORMS**RISK RATING: N/A**

Not part of this technology.

SECTION 5: ASSOCIATED SAFETY HAZARDS (CONTINUED)	
H. MOVING VEHICLES	RISK RATING: 2
The rectifier is mounted on a trailer. The trailer must be grounded and blocked to prevent movement.	
I. BURIED UTILITIES, DRUMS, AND TANKS	RISK RATING: N/A
Not part of this technology.	
J. PROTRUDING OBJECTS	RISK RATING: 3
Wire mesh inside the pads stick out and are very sharp. Leather or insulated gloves are needed for protection.	
K. GAS CYLINDERS	RISK RATING: N/A
Not part of this technology.	
L. TRENCHING AND EXCAVATIONS	RISK RATING: N/A
Not part of this technology.	
M. OVERHEAD LIFTS	RISK RATING: 1
This depends on the area that is being processed. If the surface were overhead it would create a lot of repetitive lifts over head. The technology itself does not have any over head lifts inherent in it.	
N. OVERHEAD HAZARDS	RISK RATING: 1
Would only be present if the area being processed was over head.	

SECTION 6: ASSOCIATED HEALTH HAZARDS	
Probability of Occurrence of Hazard:	
1	Hazard may be present but not expected over background level
2	Some level of hazard above background level known to be present
3	High hazard potential
4	Potential for imminent danger to life and health
A. INHALATION HAZARD	RISK RATING: 2
Chemical process creates hydrogen, sulfuric acid and in confined spaces or enclosed areas will require breathing apparatus. Scoring needs to be monitored to ensure that the amount of respirable dust being created is within limits. Sodium Sulfate used is an inhalation hazard if it is its dry powder form.	
B. SKIN ABSORPTION	RISK RATING: 1 – 2
There is a question of the creation of sulfuric acid and if so how much is being created.	

SECTION 6: ASSOCIATED HEALTH HAZARDS (CONTINUED)	
C. HEAT STRESS	RISK RATING: 1 – 4
Applying and removing the pads and the magnets can be considered a heavy workload. While the current is being applied the workload is light. During the application and removal of pads and magnets attention should be given to overexertion. Ambient conditions and PPE levels must also be considered.	
D. NOISE	RISK RATING: 3
Noise exposure is excessive during the scoring process. TWA for an 8 hour work day may be deceptive in that it is within requirements but the worker may be exposed to very high levels of noise during scoring and scrubbing. A hearing conservation program and the use of hearing protection should be implemented.	
E. NON-IONIZING RADIATION	RISK RATING: N/A
Not part of this technology.	
F. IONIZING RADIATION	RISK RATING: N/A
Not part of this technology.	
G. COLD STRESS	RISK RATING: 1
Technology does not produce a hazard but ambient conditions need to be considered.	
H. ERGONOMIC HAZARDS	RISK RATING: 3
Heavy lifting is inherent to this technology due to the use of the bus bar. Application and removal of magnets also creates ergonomic concerns. Proper lifting techniques should be taught and hazard assessment should be done prior to operation. Hand tools used when scoring and cleaning both had vibration associated with them.	
I. OTHER	RISK RATING: N/A

SECTION 7: PHASE ANALYSIS	
A. START-UP	
Proper electrical grounding and lockout/tagout for the generator and rectifier must be in place before start-up. Operators will be exposed to heavy lifting and pulling when placing bus bar and magnets, training and engineering controls to address these hazards must be in place before start-up. Scoring of surface creates high levels of noise and may create airborne particulates, monitoring for each must be done while a plan created for each is in place. ElectroPads™ have sharp edges, handling without proper PPE will result in injury. GFCI's need to be used with all 110 V tools.	

SECTION 7: PHASE ANALYSIS (CONTINUED)**B. OPERATION**

Rectifier cannot be shut down remotely. There is the possibility of burns from heat created during the process due to loose connections and cathode electrode process. Sparks are created from small short circuits, which are an ignition source. Sharp edges of mesh in pads protrude which create hazard. Hydrogen gas and sulfuric acid create a chemical hazard that may be increased in confined spaces or enclosed areas. Application and removal of magnets may create ergonomic hazard.

C. MAINTENANCE

Cuts and lacerations from sharp edges of pads are possible when removing and transporting pads. Containment of chemicals, paints, wetting solution and wash water is needed and will depend on the surface being treated.

D. DECOMMISSIONING

Operators will be exposed to heavy lifting associated with movement of bus bar. Operators will require and protection from sharp edges of wire mesh and frayed cables while decommissioning components of the process.

SECTION 8: HEALTH AND SAFETY PLAN REQUIRED ELEMENTS**A. AIR MONITORING**

Airborne particulate should be monitored during scoring. Each surface where the ElectroStrip™ process is to be used should be evaluated for possibility of the creation of inhalation hazards. Noise should be monitored with attention given to high concentrations of noise exposure in a short period of time.

B. WORKER TRAINING

Training that would apply in this case may include but not be limited to:

- HAZWOPER
- HAZCOM
- Respiratory Protection
- Hearing Conservation
- Electrical Safety
- Lockout/Tagout
- Personal Protective Equipment
- Ergonomics (proper lifting, bending, stooping, kneeling, and static postures)
- Heat stress (learning to recognize signs and symptoms)
- CPR/First Aid/Emergency Response/Blood-borne Pathogens
- Hand Signal Communication
- Construction Safety (OSHA 500) and or General Industry Safety (OSHA 501)

SECTION 8: HEALTH AND SAFETY PLAN REQUIRED ELEMENTS (CONTINUED)

C. EMERGENCY RESPONSE

Emergency response planning for a site needs to assure adequate coverage for hazards described in the TSDS. Having at least one worker per shift trained in CPR and first aid is recommended.

D. MEDICAL SURVEILLANCE

Evaluation of personnel's general health with emphasis on the back and cardiovascular/respiratory system is recommended. Medical surveillance may be required by OSHA standards such as HAZWOPER and the noise standard. The latter would require initial and annual audiograms.

E. INFORMATIONAL PROGRAM

Workers must be trained in specific operation of equipment before use.

SECTION 9: COMMENTS AND SPECIAL CONSIDERATIONS

Only personnel who have been adequately trained in the operation of ElectroStrip™ and associated hazards should be permitted to operate the system.