SECTION 6 - TECHNOLOGY SAFETY DATA SHEET

TECHNOLOGY SAFETY DATA SHEET
PEGASUS INTERNATIONAL INC.
EBE 250VHC Shot Blasting System
(WALL DECONTAMINATION)

<table>
<tr><th colspan="2">SECTION 1: TECHNOLOGY IDENTITY</th></tr>
<tr><td rowspan="3">Manufacturer’s Name and Address:

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Vertical Centrifugal Shot Blast</td><td>Signature of Preparer:

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Under cooperative agreement DE-FC21-95 MC 32260</td></tr>
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SECTION 2: PROCESS DESCRIPTION

The EBE 250VHC Vertical Shot Blasting System is a remotely operated vertical wall machine. The shot blaster uses centrifugal force to throw steel shot at the vertical surface to be cleaned. The shot and the material being removed are drawn into an air wash system which allows the heavier shot to fall back into the system's hopper for reuse while the lighter shot and the remaining material is drawn into the vacuum system for collection and disposal. The EBE 250VHC consists of two units, the shot blasting head and the dust collector. The shot blasting head weighs 550 pounds and the dust collector weighs 990 pounds. A blast hose connects the shot blasting head to the dust collector and transfers the spent shot and dust and debris from the material being removed to the dust collector for separation and final filtration. A long-handled magnet may be used to pick up shot from the walking surface surrounding the work area. This shot is then recycled.

When a forklift is used with the shot blasting head it is mounted on the forklift and suspended from a cross bar that was mounted to specially constructed attachments for the forklift. Tension straps threaded around the "Y" shaped arms at the back of the shot blasting head and a specially designed square frame that was mounted to the bottom of the forklift held forward pressure on shot blasting head. This pressure helped to hold the shot blasting head against the wall being blasted.

The shot blast head is operated from an operator control panel connected to the blast head by an umbilical line. The control panel, which is a box-type configuration 11 3/4" X 11 3/4" X 6 1/2", can be located up to 50 feet away and uses joy stick movement for control of the shot blasting head. There is an emergency stop located on the control panel that stops all operation if engaged.

The dust collection system, which has an automatic blowback feature on a High Efficiency Particulate Filter (HEPA) bank of 12 filters but does not have any pre-filters. The vacuum system can be located up to 300 feet from the shot blasting head. The system has a pan underneath the unit, which collects the dust and debris. This must be emptied by dumping the pan, scooping, or shoveling the dust and debris out of the pan.

SECTION 3: PROCESS DIAGRAMS

Process diagram not available.

SECTION 4: CONTAMINANTS AND MEDIA

The technology has the potential to cause coating, concrete, and associated contaminants to become airborne. Since the time spent in the work area, the distance from the actual blasting operation and ventilation in the work area, may affect an individual worker's exposure level, a monitoring plan will need to be developed to account for the site specific conditions where the vertical shot blasting system is being used. A complete air sampling plan for a site will need to be developed to include not only dust but also other contaminants specific to the coating and surface removal project.

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: 2

The shot blasting system and associated equipment requires electricity for operation. Appropriate precautions, such as ground-fault circuit interrupters, proper grounding, etc., need to be used. Lockout/tagout procedures need to be used when appropriate, i.e. during maintenance activities.

B. FIRE AND EXPLOSION	RISK RATING: 1

Technology does not pose this hazard in and of itself but could not be used in an explosive environment due to the potential for sparking.

C. CONFINED SPACE ENTRY	RISK RATING: 1

Not part of this technology unless the specific location where shot blaster is being used is a confined space. In this case, confined space procedures would need to be followed.

D. MECHANICAL HAZARDS	RISK RATING: 2

Use of large pieces of equipment may pose the following: pinch points, struck by, caught between, and fall from above hazards.

E. PRESSURE HAZARDS	RISK RATING: N/A
Not part of this technology.	
F. TRIPPING AND FALLING	RISK RATING: 3
Electric lines, vacuum hoses, umbilical line, and tension straps present potential hazards.	
G. LADDERS AND PLATFORM	RISK RATING: N/A
Not part of this technology.	
H. MOVING VEHICLE	RISK RATING: 4
The shot blasting head is suspended and held against the vertical surface to be cleaned by a forklift with modifications made to accommodate the shot blasting head. This presents all of the potential hazards associated with the use of a forklift. Compliance with OSHA regulations (29 CFR 1910.178 Powered Industrial Trucks) is essential. Any modifications made to the forklift need to be approved by the forklift manufacturer in accordance with 29 CFR 1910.178. Only those persons who have been properly trained in accordance with 29 CFR 1910.178 should be allowed to operate the forklift. The operator must be aware of the forklift's center of gravity and how the load, accelerating, braking, and turning affects the center of gravity and the possibility of tipping. A maintenance and inspection program needs to be in place to assure that all forklifts not in safe operating condition are removed from service.	
I. BURIED UTILITIES, DRUMS, AND TANKS	RISK RATING: N/A
Not part of this technology.	
J. PROTRUDING OBJECTS	RISK RATING: N/A
Not part of this technology.	
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: N/A
Not part of this technology.	

N. OVERHEAD HAZARDS	RISK RATING: 4

The shot blasting head may be suspended and held against the vertical surface to be cleaned by a forklift with modifications made to accommodate the shot blasting head. This presents overhead hazards and the potential for struck by and/or fall from above incidents to occur, in particular from the shot blasting head and the associated structures that were designed to fit the forklift for the purpose of suspending and holding the shot blasting head against the vertical surface.

It should be assured that all modifications made for use with the forklift have been approved by the manufacturer of the forklift; the device used for the modification meets all applicable specifications and requirements for the intended use and load (for example, welds should be done by a certified welder and then inspected in accordance with the American Society of Testing Materials (ASTM); wire rope/cable used to suspend the shot blasting head is rated for the load, inspected regularly, and in good condition before use; tension straps used to hold the shot blasting head against the vertical surface being cleaned are rated for the amount of tension to be used, inspected regularly, and in good condition before use; the ratchet system used on the tension straps are appropriate for the job, inspected regularly, and in good condition before use (a ratchet with a positive locking device and a safety clip should be used on the tension straps to avoid an accidental release of pressure); the forklift is rated for the load that will be suspended (will need to consider changes in the center of gravity because of modifications to the forklift and changes in the center of gravity because of the shifting in weight when the shot blasting head moves up-and-down and side-to-side). In addition, all personnel operating and/or working in the area where the forklift is being used must have proper forklift safety training; no one is allowed to stand or pass under the elevated portion of any forklift, whether the forklift is loaded or empty; and a forklift with a suspended load is never left without an operator in the seat at all times.

SECTION 6: ASSOCIATED HEALTH HAZARDS	
A. INHALATION HAZARD	RISK RATING: 3
Technology may produce dust from the coating or wall and its contaminants. Specific hazards will be identified from the site characterization. At a minimum, evaluation of total dust and/or respirable dust generated should be conducted. The shot may also present an inhalation hazard, especially as it becomes pulverized. The type of forklift (electric, propane, diesel, gasoline, battery) may present inhalation hazards in and of itself. These potential hazards may also need to be evaluated.	
B. SKIN ABSORPTION	RISK RATING: 1
This would be dependent on the contaminants at the site and would be identified by the site characterization.	
C. HEAT STRESS	RISK RATING: 1-4
Ambient conditions, work rates, and PPE levels must be considered.	
D. NOISE	RISK RATING: 3
The technology presents a potential noise hazard.	
E. NON-IONIZING RADIATION	RISK RATING: N/A
Not part of this technology.	
F. IONIZING RADIATION	RISK RATING: 1-4
Not part of this technology, but may be associated with surface being cleaned.	
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
Poses ergonomic hazards associated with lifting, bending, twisting, stooping and kneeling. These may cause injury/strain to the back, shoulders, arms, knees, hips and/or legs.	
I. OTHER	RISK RATING: N/A
None present at this time.	

SECTION 7: PHASE ANALYSIS

A. CONSTRUCTION/START-UP

The set-up/start-up phase presents several hazards including, pinch points, slips/trips/falls, struck by/caught between, fall from above hazards, and muscular/back injury. In addition, the potential exists for accidents associated with the use of forklifts.

B. OPERATION

The operational phase presents several hazards including exposure to contaminant (airborne and from the surface), muscular/back injury, slips/trips/falls, pinch points, struck by/caught between hazards, fall from above hazards, and exposure to noise. In addition, the potential exists for accidents associated with the use of forklifts.

C. MAINTENANCE

The maintenance phase presents several hazards including pinch points, slips/trips/falls, struck by/caught between, muscular/back injury, electrical, exposure to contaminants, and accidental activation of moving parts.

D. DECOMMISSIONING

The decommissioning phase presents several hazards, including exposure to the contaminant, pinch points, slips/trips/falls, and muscular/back injury. In addition, the potential exists for accidents associated with the use of forklifts.

SECTION 8: HEALTH AND SAFETY PLAN REQUIRED ELEMENTS

A. AIR MONITORING

When coatings on concrete or brick are blasted, total dust and respirable dust need to be monitored. Monitoring also needs to be done for specific paint and wall contaminants. In addition, noise monitoring is essential. Depending on the type of forklift (electric, propane, diesel, gasoline, battery) used with the blasting system, contaminants associated with the forklift may need to be monitored.

B. WORKER TRAINING

Training that would apply in this case may include but not be limited to: HAZWOPER (Hazardous Waste Operations and Emergency Response), HAZCOM (Hazard Communication), Respiratory Protection, PPE (Personal Protective Equipment), Hearing Conservation, Ergonomics (proper lifting, bending, stooping, kneeling), specific training for equipment operation, CPR/First Aid/Emergency Response/Bloodborne Pathogens, Electrical Safety, Lockout/Tagout, Hand Signal Communication, Forklift Safety Training, 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 person per shift trained in CPR and first aid is recommended.
D. MEDICAL SURVEILLANCE
Evaluation of personnel's general health with emphasis on the cardiovascular and respiratory system, and back. In addition, medical surveillance as required by OSHA standards must be conducted. Initial and annual audiograms.
E. INFORMATIONAL PROGRAM
Workers must be trained in specific operation of equipment before use. In addition, if a forklift is used to suspend the shot blast head, the forklift operator must be properly trained.

SECTION 9: COMMENTS AND SPECIAL CONSIDERATIONS
Due to the noise produced, communication may become difficult. Personnel working in the area should be familiar with and use hand signals as necessary. Only personnel who have been adequately trained in the operation of this technology and forklift operation and safety should be permitted to operate and/or work with the equipment.