Purpose

The purpose of this program is to provide safe guidelines for the operation and maintenance of abrasive blasting equipment and their related components

Scope

This program covers all employees involved in abrasive blasting jobs performed by Reliant Holdings Ltd and Its Affiliates. Whenever hazardous substances such as dusts, fumes, mists, vapors, or gases exist or are produced in the course of construction work, their concentrations shall not exceed the limits specified in the "Threshold Limit Values of Airborne Contaminants – 1970" of the American Conference of Governmental Industrial Hygienists. When ventilation is used as an engineering control method, the system shall be installed and operated according to the requirements of 1926.57 (Ventilation).

Key Responsibilities

Supervisors

- Be aware of potentially hazardous conditions that may arise during the blasting process prior to starting any blasting job and must take measures to protect employees.
- Ensure that all employees are trained on related safety topics.
- Understand the importance of regularly scheduled maintenance for continued safe operation of blast equipment. Ensure that all employees comply with this policy and all other related policies.

Blast Employees

- Be familiar with the safe operating functions of blasting equipment to be used on a job.
- Comply with all company policies.
- Have knowledge of hazards associated with respirable silica.
- Understand they are prohibited from using compressed air for cleaning unless the pressure is reduced to less than 30 pounds per square inch and be equipped with effective chip guarding and proper PPE.

Procedure

General

Abrasives and the surface coatings on the materials blasted are shattered and pulverized during blasting operations and the dust formed will contain particles of respirable size. The composition and toxicity of the dust from these sources shall be considered in making an evaluation of the potential hazards.

Dust shall not be permitted to accumulate on the floor or on ledges outside of an abrasive blasting enclosure. Dust spills shall be cleaned up promptly. Aisles and walkways shall be kept clear of steel shot or similar abrasives which may create a slipping hazard.

Equipment Handling

Follow these guidelines when moving blasting equipment to prevent back strains and crushing injuries:

- Use a forklift, crane or other type of lifting device for transporting a blast machine; always use a lifting device when the machine contains abrasive.
- Never manually move a blast machine where abrasive has been spilled on hard surfaces or on a wet or slippery surface.
- Never attempt to manually move a blast machine containing abrasive.
- Always disconnect hoses from machines to avoid interference during moving.

Air Compressors

- Air compressors must be located in a well-ventilated area. It must be able to contain large volumes of clean, toxicant-free air. This means the compressor must be placed up wind from the blasting operation and out of the range of dust and flying abrasives.
- Due to the high pressure that air compressors create, precautions must be taken to prevent unleashing of strong forces that can cause serious bodily injury.
- Air for abrasive blasting respirators must be free of harmful quantities of dust, mists, or noxious gases and must be inspected daily, prior to use and comply with CFR 1910.134(I) (Respiratory Protection).
- Never adjust the pressure setting on a compressor above the blast equipment maximum working pressure rating. The maximum working pressure rating is indicated on the manufacturer's metal identification plate.

Blast Pot

- Position blast pots and/or compressors on level ground. Machines operate best when they sit on level surfaces.

- For communication purposes place blast pot between the compressor and the surface to be blasted. This will enable the pot tender and operator to make visual contact.
- All couplings and pipefitting on the blast pot, compressor and hoses must be airtight.
- Blast pots must be inspected daily prior to use.

Hoses and Connectors

- Couplings must have safety wires in place and be secure as required by federal safety regulations. The operator shall be responsible to ensure that each coupling has safety wires in place.
- Whip checks must be installed at bull hose connections.
- Operator should hold onto the blast hose until the air pressure from the nozzle drops off to zero.

- Do not use hoses with soft spots.
- Never use tape to repair a blown-out hose.
- Immediately replace a hose if a blowout or leak occurs.
- Hose ends must come into contact with coupling gaskets to prevent leaks and to maintain static electricity conductivity.

Nozzles and Remote Controls

- Blast nozzles shall be bonded and grounded to prevent the buildup of static charges. Where flammable or explosive dust mixtures may be present, the abrasive blasting enclosure, the ducts, and the dust collector shall be constructed with loose panels or explosion venting areas, located on sides away from any occupied area, to provide pressure relief in case of explosion following the principles set forth in the National Fire Protection Association Explosion Venting Guide. NFPA 68-1954.
- Organic abrasives which are combustible shall be used only in automatic systems.
- Blast cleaning nozzles shall be equipped with an operating valve which must be held open manually. A support shall be provided on which the nozzle may be mounted when it is not in use.
- All blast machines must be equipped with remote control systems to start and stop the blasting process.
- Never tape, strap, or tie down an air actuated remote control lever or choke electric remote control switch.
- If there is the slightest delay in reaction time of the handle lever or lever lock to open, check for dust and dirt build-up around pivot pins before resuming blasting. Also, test the tension on the lever springs, and replace them immediately if they do not respond rapidly.
- Substituting component pieces with other manufacturer's parts is not allowed.
- Inspect blast nozzles for wear and cracks on the inner liner. When a nozzle orifice is worn 1/16" larger than its original size, it should be replaced.
- Check nozzles and nozzle holders for deterioration of thread form. Threads on nozzles and their companion holders must not be cross-threaded, worn or distorted.

- Hoses that are being tied and lifted to blasting operations being conducted above grade, i.e., scaffolds, shall be depressurized to prevent accidental start-up.

Operator Signals

- On the job site, voice communication is often impossible. Even shouts cannot be heard over the noise of compressors and blasting. In addition, the operator's head will be enclosed in the helmet, which blocks out sound and limits vision. For these reasons, an industry wide standard set of hand and sound signals has been developed.
- Signals may be visual hand movements, flashing light, pulls on a rope or sounds made by banging a hammer or using a horn or electric buzzer.
- Every operator must become familiar with the signals to be used on the jobsite.

Respirator Use

- A specific work-site procedure shall be developed where respirators or CE blasting hoods/helmets are required to protect the health of the operator. A respiratory protection program shall be established wherever it is necessary to use respiratory protective equipment including worksite specific procedures and elements for required respirator use. Abrasive blasting respirators shall be worn by all abrasive blasting operators under certain conditions.
- Equipment for the protection of eyes, face and body shall be supplied to the operator when the respirator design does not provide such protection and to any other personnel working in the vicinity of abrasive blasting operations. This equipment shall conform to the requirements of 1926.102 (Eye and Face Protection).
- Equipment for protection of the eyes and face shall be supplied to any other personnel working in the vicinity of abrasive blasting operations.

Environmental Controls

- Organic abrasives which are combustible shall be used only in automatic systems. Where flammable or explosive dust mixtures may be present, the construction of the equipment, including the exhaust system and all electrical wiring, shall conform to the requirements of American National Standard Installation of Blower and Exhaust Systems for Dust, Stock, and Vapor Removal or Conveying, Z33.1-1961 (NFPA 911961), and Subpart S of 1926.57 (Ventilation).
- The work area must be inspected for exterior electrical power lines that may endanger operators.
- Operators should use care to avoid directly blasting power lines and insulators.
- Do not blast in atmospheres that contain flammable fumes.
- Take precautions at the work site to eliminate hazardous surface obstacles that may cause tripping hazards or interfere with worker mobility.
- Adequate ventilation must be provided for employees working within enclosures.

- Never operate compressor if hoses are frozen. When winter temperatures drop below freezing, check for ice prior to pressurizing hoses.
- Do not use silica based blasting material.
- Provide adequate drinking water for operators, especially during summer.

Personal Protective Equipment

- Secure hoses by tying them to scaffolding or personnel platforms, when working from elevations, to prevent injury from hoses falling on other personnel working below or near blasting area.
- Before using any blasting abrasive, check the MSDS to find out the chemical composition of the abrasive material.
- Equipment for the protection of eyes, face and body shall be supplied to the operator when the respirator design does not provide such protection and to any other personnel working in the vicinity of abrasive blasting operations. This equipment shall conform to the requirements of 1926.102 (Eye and Face Protection).

- Ventilation systems and dust collectors may be necessary in enclosed conditions.
- Noise from abrasive blast nozzles can be loud enough to damage the hearing of blasters and others on the work site. Workers must not be exposed to noise levels exceeding 80 decibels as an eight-hour time weighted average (80 dBA TWA), therefore all blasters shall wear earplugs.
- Blaster must wear heavy-duty gloves and steel toe boots.
- Helmet lenses should be changed as soon as pitting or frosting takes place.

Pre-Job Planning Process

Prior to starting the job, it is critical to identify all hazards and remove or control the recognized risk. Each person involved with the work must be made aware of the hazards and controls prior to starting the job. Complete a Work Hazard Management System Form

  Prior to starting the job complete a Job Safety Analysis (JSA) with all the crew members at the job site.

ABRASIVE BLASTING CHECKLIST

☐ ☐ ☐ Location: _____ Lead Person at Jobsite:_____

☐ ☐ ☐

☐ ☐ ☐

☐ ☐ ☐

☐ ☐ ☐

Yes No N/A

Worksite Environment

Has a hazardous blasting zone been established at the job site that includes the blast area and areas where dust concentrations may exceed OSHA's permissible exposure limits?

Has the composition of the materials to be blasted been investigated for lead, asbestos and other heavy metals and toxics?

Have electrical lines and hoses in the blast area been identified and protected from blasting operations?

Has the atmosphere in the work area been tested to ensure that it will be safe to breath?

Have all the work surfaces been inspected, holes covered, water and other liquids removed, and ice, snow and other slippery surfaces controlled?

Are air movers and vacuum/dust collectors being used to provide clear visibility for the blasters?

Is hearing protection available for personnel exposed to greater than 80 dba and double hearing protection available to those exposed to greater than 100 dba?

oil lubricated compressor is used for breathing air, is it equipped with a high temperature and carbon monoxide alarm?

☐ ☐ ☐ If an oil lubricated compressor is used for breathing air, has the air quality been tested within the last quarter to determine that it meets the CGA standard for "Grade D "breathing air?

☐ ☐ ☐ If an air compressor or pump is used for breathing air, is it positioned so that the air intake is positioned to prevent the ingestion of engine exhaust or other toxic gases, vapors or fumes?

☐ ☐ ☐ Is the compressor or air pump and air lines shutoff and depressurized prior to performing maintenance?

Yes No N/A

Airlines

Have the airlines and connections been inspected for wear and damage and been repaired, prior to use?

Have the gaskets for each connection been inspected and replaced if worn, distorted or too soft?

Are airlines laid out so that they will not obstruct workers?

Are safety pins and whip checks installed on all connections?

Abrasives

☐ ☐ ☐ Are appropriate NIOSH approved respirators being used during blasting and cleanup?

☐ ☐ ☐ Are mechanical lifting devices used to assist in loading and handling abrasives?

☐ ☐ ☐ Does the abrasive contain less than 1% crystalline silica?

☐ ☐ ☐ Has the Material Safety Data Sheet (MSDS) been reviewed for the blasting agent and hazardous compounds?

Have all fittings and valves been checked for tightness and found to be in good operating condition?

☐ ☐ ☐ Have damaged gaskets and parts been replaced?

☐ ☐ ☐ Has the machine been inspected for dents and other damage?

Abrasive Metering Valve

☐ ☐ ☐ Does the valve handle move freely for accurate adjustment of abrasive flow?

Remote Controls

Is the blast machine equipped with a remote control system? OSHA 29 CFR 1910.244

Is the remote control handle allowed to be strapped, taped, wired, or otherwise secured in a position that will interfere with the movement of the lever?

Yes No N/A

☐ ☐ ☐ Is the abrasive trap cleaned at least twice each shift to avoid restriction in the air exhaust?

Pressure Regulators

☐ ☐ ☐ Are pressure regulators specifically designed for nozzle air volumes and pressures per the manufacturers recommendations?

Screens & Covers

☐ ☐ ☐ Is a screen used to keep debris out of the blast machine?

☐ ☐ ☐ Is a cover used to protect the entry of moisture when not in use?

Couplings

Are the couplings inspected daily for damage prior to use?

Are hoses inspected daily for wear and soft spots?

☐ ☐ ☐ Are couplings wired together and whip checks installed to prevent disengagement and whipping?

☐ ☐ ☐ Is static dissipating hose used to prevent the buildup of static electricity?

☐ ☐ ☐ Is the size of the blast hose 3 to 4 times the size of the nozzle orifice to prevent premature hose wear?

☐ ☐ ☐ Are hoses laid out in long curves to reduce premature wear and blowouts?

Nozzles

Is the nozzle washer inspected before each use and replaced if worn?

Is the nozzle replaced if the orifice size increases to 1/16” larger than its original size?

Blaster’ Safety Equipment

Is the blaster wearing a NIOSH Type CE respirator?

Are others personnel working in the same area wearing appropriate respiratory protection?

Yes No N/A

☐ ☐ ☐ Are appropriate head, eye, face, and hearing protection being used by all personnel?

Is the air supply at least CGA "Grade D?"

Is the breathing air filtered to remove moisture, oil mists, and particulates?

☐ ☐ ☐ Is the helmet inspected for wear and damage before each use?

Are lenses replaced frequently?

☐ ☐ ☐ After blasting is the dust removed from the helmet and clothing before they are removed?

Is the helmet stored in a clean, dust free location away from the blasting operation?

Has the carbon monoxide monitor and alarm system been calibrated?

Blaster

Has the blaster been trained qualified to the equipment, functions, blasting techniques, abrasives, maintenance requirements and safety features?

Has the operator participated in the pre-job safety meeting?

Scaffolding

☐ ☐ ☐ Has the scaffold been inspected and signed off for use?

☐ ☐ ☐ Is the scaffolding equipment equipped with the appropriate guard rails and work platforms?

☐ ☐ ☐ Is the staging surfaces level, smooth, and free of obstructions?

Inspection Completed by: _____ _____ _____

Print Name Signature Date

_____

Location