



**HEALTH, SAFETY &
ENVIRONMENTAL PROGRAM**

Section: Occupational Health

PREPARED BY: HEALTH AND SAFETY TEAM

DATE OF ORIGIN: 02/02/2023

REVISION # 1

OF PAGES: 25

OCCUPATIONAL HEALTH

PURPOSE

CF is committed to providing a safe and healthy workplace for its employees. Identifying and controlling health hazards in the workplace are essential to maintain the health and safety of our employees.

SCOPE

Worker Wellness

CF recognizes the benefits of a healthy workforce and encourages and supports employees in achieving ownership for their physical, mental, and emotional well-being, resulting in improving overall health and wellness. CF will promote and support healthy worker wellness initiatives in, and outside of work activities.

Noise Standard

All workers working in a noisy environment are required to use and wear hearing protection. Audiometric testing may be required based on the specific jurisdiction. If not certain please consult with the H&S Dept.

Procedure

Noise in excessive amounts is a known health hazard.

- Exposure to excessive noise leads to permanent hearing loss in most cases.
- Employees exposed to noise levels greater than 85 dBA require adequate hearing protection for the hazard.

Noise exposure guideline for work related activities at the operator position are:

Radial Saw 10" Steel Blade	90-95
Cut-Off Saw 8" Steel Blade	85 -95
Hand Grinder 6" Stone	101-105
Jackhammer 80 Lb	96-100
Chipping Air Hammer	106-110
Metal Cut-Off Saw 12" Fibre	111-115
Arc Welding	96-100
Automatic Welding	96-100
Explosive Actuated Tools	Over 115
Sandblasting	96-100
Jumping Jack	111-115
Electric Drill	85 or under
Portable Grinder	90-95
Crawler Loader	101-105
Rubber Tire Loader	96-100
Compressor (250 CFM)	101-106
Compressor (250 CFM) Silenced	less than 85



**HEALTH, SAFETY &
ENVIRONMENTAL PROGRAM**

Section: Occupational Health

PREPARED BY: HEALTH AND SAFETY TEAM

DATE OF ORIGIN: 02/02/2023

REVISION # 1

OF PAGES: 25

OCCUPATIONAL HEALTH

Compressor (900 CFM) 106-110

Compressor (900 CFM) Silenced less than 85

Points to Remember

- Clean plugs or muffs to prevent ear infection
- Hearing protection makes it easier to converse in a noisy area
- Dry cotton batten is no protection against noise
- Wax impregnated cotton batten and ear plugs with metal inserts DO NOT WORK
- Muffs are more effective than plugs
- Plugs come loose if you talk or chew
- Hypo-allergenic ear plugs are available to those who require it

Hazardous Substances – Procedure Format Standard

Managers shall request from the H&S Department a written procedure when the workforce may be exposed to a designated substance.

Procedure

Note: Check with local jurisdictions on designated substances written procedures shall include:

1. Name of the designated substance.
2. Known health hazards.
3. Engineering controls, work practices, hygiene practices and facilities to control work exposure to the substance.
 - a. Note: If you are regularly working extended hours (more than 8hrs) for the day or shift contact the H&S Department ensure acceptable exposure limits are not exceeded.
4. Methods and procedures to monitor the concentration of the substance in workplace air.

Workers' Records

Workers' records of exposure to the substance shall include:

1. Worker's name
2. Worker's date of birth
3. Worker's occupation
4. Respiratory equipment used
5. Monitoring results

Workers' records must be maintained by the employer and be available upon request by each worker's physician.

Procedure for Cleaning up and Disposal of Bio-Hazardous Waste Standard

This procedure has been developed to protect employees when there has been exposure to bio-hazardous waste.



**HEALTH, SAFETY &
ENVIRONMENTAL PROGRAM**

Section: Occupational Health

PREPARED BY: HEALTH AND SAFETY TEAM

DATE OF ORIGIN: 02/02/2023

REVISION # 1

OF PAGES: 25

OCCUPATIONAL HEALTH

Definition

Bio-hazardous waste includes any infectious waste, or potentially infectious substance such as blood or other human waste. Blood and human waste have the potential to spread infectious diseases like Hepatitis B, C and HIV. Even though uninfected blood is relatively safe to clean, all blood spills should be treated as infected.

Procedure

On a job site where bio-hazardous waste is discovered and could present a hazard to a worker this procedure may be followed.

Discovery of Bio-Hazardous Waste

- Restrict Access - Restrict access to the area by using barrier tape or other physical separation. Only authorized staff or service providers will be allowed to enter the restricted area.
- Notification – Notify the supervisor, who will notify the H&S department to determine if the clean-up process will be completed internally, or if an external service provider is required.
- Clean-up and Disposal
- Personal Protective Equipment: Protection - An individual who cleans up blood and bodily fluid spills must wear personal protective equipment (PPE). Gloves, Disposable Tyvek Suit, masks or face shields are all acceptable and appropriate personal protective equipment to wear for exposure to blood and bodily fluids. A good practice is to double glove and wear an N-95 Mask.
- Barrier - Creating a barrier around the waste prevents it from spreading and contains it so that it can be cleaned. Barriers can be made of any absorbent material such as kitty litter, dirt, sand, sawdust or salt.
- Disinfect - Health hazards still exist even after the waste has been removed. Disinfecting the area is an important step. The supervisor will ensure the appropriate disinfecting product is used for the bio-hazardous waste. This will typically be bleach based cleaners. All cleaning tools should go through a disinfecting process or should be disposed of in appropriate biohazard waste containers or packaging.
- Broken Objects - Never pick up broken objects such as glass bottles by hand. It is strongly advisable for employees to use mechanical means to pick up all broken glassware. Use forceps, tongs, brooms and dustpans.
- Disposal - Never throw away broken glassware or sharp substances into general receptacles. Discard these items into "Sharps" containers or sealed, closable, puncture-resistant containers labeled with caution signs.

Ensure all disposable material is double bagged, and disposed of as per local requirements pertaining to bio-hazardous waste. Ensure everything has at least a double layer of containment, and is labeled with Biohazard Tag.

Inform Personal at Waste Management what they are to receive so they can also take appropriate precautions. A good practice is for all cleaning areas to have a Biohazard Kit made available to workers.

A Biohazard kit may include:

- 1 Labeled Sealed HD Bag (or 5 Gal bucket) with Seal to show it has not been opened.
- 20 4x4 Absorbent pads,
- 10 lb. Sack of kitty litter or other absorbent product.
- 3 Tyvek Suits



**HEALTH, SAFETY &
ENVIRONMENTAL PROGRAM**

Section: Occupational Health

PREPARED BY: HEALTH AND SAFETY TEAM

DATE OF ORIGIN: 02/02/2023

REVISION # 1

OF PAGES: 25

OCCUPATIONAL HEALTH

- 3 prs. Goggles
- 1 box Nitrile or Latex Gloves
- 6 prs. Booties
- 1 Roll of Red Tape with Caution Tags
- Roll of Duct Tape
- 4 Laminated Biohazard Tags
- 1 Sharpie Marker
- 10 Garbage Bags,
- 6 N-95 Masks
- 3 Face Shields

Note: Kit contents should reflect the anticipated hazards based on site specific conditions.

Bio-Hazardous Waste - Syringes Standard

This procedure has been developed to assist employees when discarded syringes are discovered on the project.

Procedure

On a job, site where discarded syringe/needle is discovered in a work area and may pose a hazard to a worker this procedure will be followed.

1. Determine if the location of the discarded syringe will pose a hazard to a worker on the site.
2. If the syringe will not pose a hazard to a worker, it will be covered or guarded and the supervisor will be notified.
3. If the syringe may pose a hazard to a worker, the supervisor will be notified immediately.

Supervisor

Upon notification, the supervisor will:

1. Contact the owner of the work area for further instruction on the handling and disposal of bio hazardous waste
2. Notify CF H&S Department to advise of the existence of bio hazardous waste on the project.
3. Should the owner or owner's representative be unable to provide adequate procedures on the handling and disposal of the syringe, the supervisor or person designated by the supervisor will;
 - a. Refer to and follow the Sharps Procedure

Do not dispose of bio hazardous waste with regular garbage.

Should any worker suffer a wound involving bio hazardous waste, they should seek medical attention promptly. Advise H&S Department immediately.



**HEALTH, SAFETY &
ENVIRONMENTAL PROGRAM**

Section: Occupational Health

PREPARED BY: HEALTH AND SAFETY TEAM

DATE OF ORIGIN: 02/02/2023

REVISION # 1

OF PAGES: 25

OCCUPATIONAL HEALTH

Procedure for Handling and Disposal of Sharps

Objective

To reduce the risk of infection or injury by ensuring the safe disposal of sharps

Definition

Sharps are objects used for medical purposes that can penetrate the skin such as discarded needles or syringes with needles attached. These injuries can allow infections to enter the body. Infectious diseases such as Hepatitis B or C, HIV or Tetanus can enter this way.

Primary Risk Areas

Some work areas will have higher risk for discovery or exposure to sharps, for example; manholes, pipe clean outs, outfall areas when flushing sewer lines, removing pipe plugs, demolition/renovation (particularly hospitals/clinics etc) or clearing/surface preparation for excavation in out of the way locations/parks where litter from drug use may be a factor.

Supervisors

Should be able to assess and identify the potential for needle stick hazards in the workplace. Treat all needles as potentially contaminated or infectious.

Basic Prevention

- Workers should not put their hands in places they cannot see unless they are protected by puncture proof gloves. (see Glove Program)
- Do not work where there is insufficient light to see sharps or other hazards.
- When disposing of sharps, workers must use a portable sharps disposal kit: consisting of puncture resistant disposable gloves, tongs or pliers (made of material that is compatible with chlorine) and a labeled Sharps Container for the disposal of discarded needles).
- The container should be rigid walled and puncture resistant: A commercial Sharps Container is preferred. (see picture).
- Workers who could potentially be exposed should be trained on the safe disposal of needles or other sharps, inspection of the sharps container and clean up requirements.
- The potential for exposure to sharps should be identified on the JSA or FLRA card and reviewed with the crews prior to commencing work.
- All workers should be made aware of the location of the sharps response kit prior to commencing work.

Procedure for Disposing and Transportation of Sharps

- When disposing of sharps, bring the container to the needle – do not carry the needle over to the container.
- Use an appropriate implement (e.g. tongs or pliers) and wear disposable, puncture resistant gloves to handle sharps.
- Place the container for sharps disposal on a flat surface as close as possible to the needle. Open the lid of the container.



**HEALTH, SAFETY &
ENVIRONMENTAL PROGRAM**

Section: Occupational Health

PREPARED BY: HEALTH AND SAFETY TEAM

DATE OF ORIGIN: 02/02/2023

REVISION # 1

OF PAGES: 25

OCCUPATIONAL HEALTH

- Using the tongs, pick up the needle by the blunt end (plastic fitting). Holding the needle-sharp tip down and away from your body, put the needle in the container for sharps disposal. If there is more than one needle, pick them up one at a time.
- Close the container securely.
- Remove gloves by peeling them back from the top so they are inside out, then dispose.
- Wash hands with soap and water or if not available use hand sanitizer with 60% alcohol or better.

Pre-Use Checks, Transportation and Disposal

Before using a Sharps container – ensure that the container

- Is not punctured
- Is not filled above the “full” line. DO NOT overfill.
- Is not leaking or cracked
- Closable lid is in good condition
- Once the Sharps container is full, or when deemed necessary, the securely closed container shall be disposed of by taking it to a hospital, pharmacy or special bio- waste collection site that disposes of the used containers.
- While in transport the sharps container must be securely stored away where there is no danger of it being damaged or dislodging in transport.

Response in the Event of Injury / Exposure

- Any employee who receives an injury from a needle or other sharp should be treated using first aid measures.

Note: Any needle stick injury should be allowed to bleed freely.

- The injured worker should seek medical attention directly.
- All needle stick injuries must be reported immediately to H&S Department and subsequently to the appropriate agency as required (e.g. Ontario – WSIB).

Sharps Containers





**HEALTH, SAFETY &
ENVIRONMENTAL PROGRAM**

Section: Occupational Health

PREPARED BY: HEALTH AND SAFETY TEAM

DATE OF ORIGIN: 02/02/2023

REVISION # 1

OF PAGES: 25

OCCUPATIONAL HEALTH

Sharps Response Kit - Equipment Needed

Puncture resistant disposable gloves (always have several pairs available), Commercial Sharps Container, Tongs, Bleach, Hand Sanitizer with minimum 60% alcohol.

Cleanup Procedures

All tongs or pliers should be thoroughly washed with a solution of 9 parts water one part Chlorine (Bleach), rinsed in clean water and stored in a clean dry container.

Hazardous Substances

Standard

Managers shall be aware of the existence of hazardous substances in the workplace and shall ensure compliance with pertinent regulations.

Procedure

Definition of Hazardous Substances

Hazardous substances are defined biological, chemical, or physical agents in the workplace known to have adverse effects on human health and safety. These substances have legal status and are attached to legal exposure limits.

At date of issue, the following substances are legally designated as "controlled":

- Acrylonitrile
- Asbestos
- Benzene
- Coke Oven Emissions
- Isocyanates
- Lead
- Mercury
- Silica
- Vinyl Chloride
- Asbestos on construction projects and repair operations

Workers may be exposed to other hazardous substances (physical, chemical and biological). Workers and Supervisors should take appropriate measures to reduce, substitute, control or eliminate these hazards. Examples of such hazardous substances are formaldehyde, cadmium, chromium, coal tar, nickel, styrene, cold, heat, and noise. Exposure means: inhaled, ingested, absorbed, injected. Contact the H&S Department for assistance.

PCBs – General Information Standard

Workers involved in the handling of PCBs shall be familiar with their characteristics and the necessary safety precautions and training.

Procedure

- PCB means polychlorinated biphenyls, manmade chemicals manufactured on a large scale from 1929 until 1977.
- PCBs are very stable, non-corrosive, relatively non-flammable, and insoluble in water and have low vapour pressures.
- PCBs are excellent in insulating and thermal properties.
- Common past uses:



**HEALTH, SAFETY &
ENVIRONMENTAL PROGRAM**

Section: Occupational Health

PREPARED BY: HEALTH AND SAFETY TEAM

DATE OF ORIGIN: 02/02/2023

REVISION # 1

OF PAGES: 25

OCCUPATIONAL HEALTH

- Carbonless copying paper
- Heat exchange fluids
- Hydraulic fluids
- In electrical transformers and capacitors
- "Askarel" is a generic term for PCBs used in electrical insulating liquids. Under arcing conditions, askarel produces a non-combustible hydrogen chloride gas with lesser amounts of combustible gases. Hydrogen chloride gas may threaten life even during short – term exposure.
- Identification of PCBs in Capacitors:
- Practically ALL liquid - dielectric AC power capacitors manufactured between 1930 and 1977 contain PCBs
- PCB capacitors manufactured after 1978 are often marked "No PCBs"
- Capacitors containing WEMCOL, FARADOL 100, DIELEKTRO II, or DPO do not contain PCBs; assume that all others DO contain PCBs
- Capacitors are usually hermetically sealed
- Common Brand Names for PCBs:

Apirolio	Elemex	Phenochlor
Aroclor	Eucarel	Pydraul HY
Asbestos	Fenclor	Pyralene
Chlophen	Hyvol	Pyranol
Chlorextol	lor	Pyroclor
Chlorinol	Inerteen	Saf-T-Kuhl
Diaclor	Kanechlor	Santotherm FR
DK (decachlorodiaphenyl)	Montar	Sovol
Dykanol	No-flamol	Therminol FR HT

- Health Effects of PCBs:
 - Enter human tissue by: inhalation, absorption or ingestion
 - Everyone is exposed to PCBs through the food chain
 - There is no evidence that low levels of exposure to PCBs is harmful to health
 - Workplace exposure to PCBs has been virtually eliminated
 - Fires involving PCBs may produce furans and dioxins which are toxic
 - Brief exposures to small amounts of PCBs are not a serious health concern
 - It is not known whether PCBs are carcinogens (the scientific community is divided on the issue).
- Identification of PCBs in Transformers:
 - Any transformer that was manufactured in North America WITH a conservator tank was NOT designed to use PCBs and probably contains mineral oil
 - A transformer's nameplate, attached to the outside of the transformer casing, which has the designation O, ONS, ONAN, ONWF or any label beginning with O, is filled with mineral oil
 - A transformer's nameplate which has the designation beginning with L, such as LNaN, LNAF, and LNWF etc. is filled with non-flammable or flame retardant liquid. MOST of these L transformers, manufactured before 1979, are PCB transformers



**HEALTH, SAFETY &
ENVIRONMENTAL PROGRAM**

Section: Occupational Health

PREPARED BY: HEALTH AND SAFETY TEAM

DATE OF ORIGIN: 02/02/2023

REVISION # 1

OF PAGES: 25

OCCUPATIONAL HEALTH

- Environment Canada has developed a voluntary labeling system for PCB containers. These labels resemble a WHMIS / Hazard Communication label and have PCB in bold letters.
- Hydrogen chloride gas may threaten life even during short-term exposure.

PCBs – Personal Protective Equipment Standard

All workers involved in the handling of PCBs shall wear the prescribed personal protective equipment.

Procedure

The following precautions are mandatory when handling PCBs:

- Gloves (any of these):
 - Butyl Rubber
 - Neoprene
 - Nitrile Rubber
 - Polyvinyl Alcohol (PVA)
 - Viton
 - Saranex
 - Teflon

NEVER work with bare hands when handling PCBs.

- If temperature exceeds 55°C (131°F) and there is the risk of vapour escaping into the air, use self-contained breathing apparatus (SCBA) or supplied air
- respirators.
- If temperature does not exceed 55°C (131°F) and there is no risk of inhaling vapours (such as with hermetically sealed capacitors) no respiratory apparatus is required.
- If temperature does not exceed 55°C (131°F) and there is the risk of vapours escaping into the air (such as with transformers, tanks etc.) use full-face mask with organic vapour canisters.
- When handling PCBs, do not smoke, eat or drink before completely washing your hands and face.
- Dispose of protective equipment by placing it in the same container as the PCB waste when operation is completed.

DO NOT ATTEMPT TO CLEAN PROTECTIVE EQUIPMENT FOR REUSE.

- If trichlorobenzene (a solvent) is present in the PCB apparatus, use a full-face mask with organic vapour canisters.
- If the possibility of PCB contact with body parts exists, wear coveralls composed of one of the materials listed under gloves. Rubber or PVA shoes or boot covers are recommended.
- One Class C 10 lb CO2 fire extinguisher shall be located within 3 m (10') of the work area when PCB facilities are being handled.

PCBs – Waste Storage Standard

Various legislative publications such as, "Manual for the Management of Wastes Containing Polychlorinated Biphenyls (PCBs)" will be the reference documents for the acceptable means of PCB waste storage.



**HEALTH, SAFETY &
ENVIRONMENTAL PROGRAM**

Section: Occupational Health

PREPARED BY: HEALTH AND SAFETY TEAM

DATE OF ORIGIN: 02/02/2023

REVISION # 1

OF PAGES: 25

OCCUPATIONAL HEALTH

Procedure

- The responsibility for PCB removal and storage is the owner/manager of the facility.
- CF is not authorized to transport PCB waste on public property or roadways.
- CF is not authorized to attempt to destroy PCB waste.
- The responsibility for the safe storage of PCB waste is the responsibility of the owner.

Lead Standard

The supervisor in consultation with the H&S Department will ensure that all necessary measures and procedures are taken to prevent worker exposure to Lead.

Routes of Entry

Lead may affect the health of workers if it is in a form that may be inhaled (i.e. airborne particles) or ingested. Shortly after lead is inhaled or ingested, it can enter the bloodstream and travel to soft tissues (such as the liver, kidneys, lungs, brain, spleen, muscles, and heart). After several weeks, most of the lead moves into your bones and teeth and can be stored there for a long time.

Early signs of lead poisoning includes:

- Tiredness
- Irritability
- Muscle and joint pain
- Headaches
- Stomach aches and cramps

Harmful effects can follow a high exposure over a short period of time (acute poisoning), or long-term exposure to lower doses (chronic poisoning).

Workers that are exposed to lead may require additional health assessments and surveillance as per the jurisdiction. Consult with the H&S Department for specific programs and obligations.

Workplace Exposure and Monitoring

Work activities involving lead will be designed to ensure workers are not exposed beyond the occupational exposure limits for the jurisdiction.

Clients, or property owners, are obligated to inform CF representatives of any existing hazardous materials, including lead in the workplace. This information should provide the details as to the amount and locations of lead in the workplace. This information will be required to determine worksite specific procedures for the handling, disturbance or removal of the lead or lead containing products.

In the event a worker suspects an unidentified product to contain lead, protect the area and contact your supervisor immediately.



HEALTH, SAFETY &
ENVIRONMENTAL PROGRAM

Section: Occupational Health

PREPARED BY: HEALTH AND SAFETY TEAM

DATE OF ORIGIN: 02/02/2023

REVISION # 1

OF PAGES: 25

OCCUPATIONAL HEALTH

Where work involving lead or lead contain products occurs, a monitoring process such as air sampling or particulate measurement will be required to monitor exposure levels. The specific monitoring process will be workplace specific.

Symptoms of Acute Lead Poisoning

Includes a metallic taste in the mouth and gastrointestinal symptoms such as vomiting, abdominal cramps, constipation, and diarrhea.

Symptoms of Chronic Lead Poisoning

Are more difficult to recognize because they are similar to many common complaints. However, severe chronic poisoning can lead to more characteristic symptoms, such as a blue line on the gums, wrist drop (the inability to hold the hand extended), severe abdominal pain and pallor.

Lead can also cause serious damage to a number of systems in the body including the blood, kidneys, gastrointestinal, nervous and reproductive systems

General measures and procedures are suggested for all work with lead:

- Washing facilities consisting of a wash basin, water, soap and towels should be provided and workers should use these washing facilities before eating, drinking, smoking or leaving the project
- Workers should not eat, drink, chew gum or smoke in a work area
- Dust and waste should be cleaned up at least daily and placed in a container that is:
 - Dust tight
 - Identified as containing lead waste
 - Cleaned with a damp cloth or a vacuum equipped with a HEPA filter immediately before being removed from the work area
 - Removed from the workplace frequently and at regular intervals
 - The work area should be inspected at least daily to ensure that the work area is clean
 - Compressed air or dry sweeping should not be used to clean up any lead- containing dust or waste from a work area or from clothing

Dust Control Measures

Enclosed Work Areas:

- The enclosure should be inspected for defects by a competent person;
- Defects should be repaired before any work that would generate lead-containing dust is carried out within the enclosure.
- Air exhausted from an enclosed work area should pass through a dust collector

Burning, Welding or High Temperature Cutting of a Material with a Lead-Containing Coating:

- Local exhaust ventilation should be used where there is burning, welding or high temperature cutting of a material that has a lead-containing coating
 - The air velocity at any point in front of or at the opening of the ventilation hood should be sufficient to overcome opposing air currents and capture the contaminated air by causing it to flow into the hood.
 - The air velocity at the source of the lead dust, fumes or mist should be at least 0.5 meters per second.



**HEALTH, SAFETY &
ENVIRONMENTAL PROGRAM**

Section: Occupational Health

PREPARED BY: HEALTH AND SAFETY TEAM

DATE OF ORIGIN: 02/02/2023

REVISION # 1

OF PAGES: 25

OCCUPATIONAL HEALTH

Air discharged from the local ventilation system should pass through a HEPA filter and be routed out of the workplace in a way that will prevent the return of the contaminants to the workplace.

Note: If local ventilation is not practicable, an appropriate respirator should be used. Please consult your H&S Department.

Removal of Lead-Containing Material with Power Tools

Where lead-containing material is being removed with power tools, the generation of airborne dust should be controlled by:

- An effective general or local exhaust ventilation system if the operation is carried on indoors
- If a general or local exhaust ventilation system is not practical, an appropriate respirator should be used.

Personal Protective Equipment

Please contact your H&S Department for assistance and selection of the appropriate PPE.

Silica

Silica can be found in many forms on a construction project. In aggregates, concrete, cement products and other materials.

Standard

The supervisor in consultation with the H&S Dept. will ensure that all necessary measures and procedures are taken to prevent worker exposure to Silica.

Health Effects of Silica Exposure

Crystalline silica may be harmful following high exposure levels received over a period, ranging from a few weeks to years or after long-term exposures to lower levels.

The prolonged inhalation of air born dust containing crystalline silica may result in silicosis, a disease characterized by progressive fibrosis of the lungs. Silicosis is marked by shortness of breath and impaired lung function.

Crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is carcinogenic to humans. In order for silica to be a hazard, silica-containing dust particles that are small enough to be inhaled (i.e. air born,) must get into the air.

Workers that are exposed to silica beyond the occupational exposure limits may require additional health assessments and surveillance as per the jurisdiction. Consult with the H&S Department for specific programs and obligations.

Dust Control Measures

- The generation of airborne silica-containing dust should be controlled with a mechanical ventilation system, wetting, or the use of a dust collection system.



**HEALTH, SAFETY &
ENVIRONMENTAL PROGRAM**

Section: Occupational Health

PREPARED BY: HEALTH AND SAFETY TEAM

DATE OF ORIGIN: 02/02/2023

REVISION # 1

OF PAGES: 25

OCCUPATIONAL HEALTH

- If it is not practical to use mechanical ventilation, respiratory protections may be used. Please consult your health and safety department for guidance and assistance
- If compressed air is being used to remove silica-containing dust outdoors, workers within 25 meters of the work area who may be exposed to the dust must either be removed from the path of the dust cloud or provided with respirators

Indoor Operations

- If sandblasting is being conducted indoors and persons other than those doing the sandblasting may be exposed to silica-containing dust, the sandblasting area should be separated from the rest of the project by an enclosure that will confine the dust within the sandblasting area.
- Appropriate signage identifying the silica hazard should be posted.

Outdoor Operations

- If sandblasting is being conducted outdoors and persons other than those doing the sandblasting may be exposed to silica-containing dust, the work area should be identified by ropes or barriers located at least 25 meters from the sandblasting area, to prevent entry by workers not directly involved in the operation.
- If it is not possible to locate the ropes or barriers at least 25 meters from the sandblasting operation other control measures such as barricades and enclosures should be implemented.
- This will ensure that the sandblasting area is separated from the rest of the project by an enclosure that will confine the dust within the sandblasting area.

Enclosures

The following requirements should be met:

- Entry ways in the enclosure should be equipped with air locks, overlapping door tarps or doors;
- All openings and joints in the enclosure should be completely sealed;
- The air pressure within the enclosure should be negative relative to the outside;
- The air velocity within the enclosure shall be appropriate and pass each work;
- The escape of abrasive and debris from the enclosure should be controlled at air make-up points by the use of baffles, louvers, flap-seals and filters. If the enclosure is located outdoors, these additional requirements should be met:
 - The enclosure should be made of windproof materials that are impermeable to dust;
 - The enclosure should be supported by a structure that prevents more than minor movement of the enclosure.

Dust Control Measures

If an enclosure is used to protect other workers on the project from silica exposure, air exhausted from the enclosure should pass through a dust collector that can remove the particulate matter from the air at the volume and velocity at which it is moving.



**HEALTH, SAFETY &
ENVIRONMENTAL PROGRAM**

Section: Occupational Health

PREPARED BY: HEALTH AND SAFETY TEAM

DATE OF ORIGIN: 02/02/2023

REVISION # 1

OF PAGES: 25

OCCUPATIONAL HEALTH

Respirators

A worker operating an electric, pneumatic or gas powered cutting device in dry mortar, concrete or similar material or sandblasting will wear approved respiratory protection. For respirator selection, care, use and fit testing please consult with your H&S Department.

Clean-up

When an indoor sandblasting operation is completed, dust and waste should be cleaned up and removed by vacuuming with an HEPA-filter-equipped vacuum and wet sweeping or wet shoveling.

Personal Protective Equipment Code of Practice for Silica Dust

All employed will wear appropriate respiratory protection when exposed to airborne hazards that are determined to exist at the crusher plant site, in particular but not limited to, silica dust. The optimum functional protection for silica dust has been determined to be 3m 1620 or 8210-8511.

- Proper training in use and maintenance of the equipment must be received by employees.
- Masks must be fitted for proper wearing and employees must be trained in how to fit and wear appropriate mask.
- Employees will be tested to ascertain baseline exposure to each particular airborne hazard. Special consideration will be given to any employee with preexisting sensitivity, disease, allergies or medical condition. Subsequent on-going testing will be done to ascertain high risk cases for health degradation.
- Discard filter masks after shift usage and start shift with a clean mask.
- All employees that are required to work in areas considered high dust areas or the work that is required will increase the amount if dusts are required to wear dust masks.
- Management and workers will conduct their work so as to minimize the amount of exposure to it in the following but not limited to manners:
 - Setup equipment to minimize dust carried by prevailing winds to the workers if possible.
 - Shorten the amount of time to do a task in a dust area as much as possible.
 - Try to do cleanup on plant shut down times.
 - Clean equipment and power unites towers as much as possible to remove dust (wear mask to do this) use cab filters.
 - Leave dust covered work clothes at work to minimize taking it home.
 - Company supplied clothes that are contaminated should stay at work and be laundered from there.
- Use water sprayed systems and other methods to cut down on dust as much as possible.
- Maintain belt flashing and screens and conveyors as much as possible to eliminate sand and dust build-up around the equipment from spillage and debris.
- Shorten the drop distance of material coming off conveyors and screen decks as much as possible so transfer points do not contribute to dust.
- Close doors on power/tower shacks and make sure doors and windows seal properly to keep interiors dust free.
- Use air conditioning where possible to keep doors and windows sealed.
- Rotate workers on jobs to minimize exposure.
- Post signs indicating silica dust is present in the high dust areas considered restricted and correct Personal Protective Equipment is required?



HEALTH, SAFETY &
ENVIRONMENTAL PROGRAM

Section: Occupational Health

PREPARED BY: HEALTH AND SAFETY TEAM

DATE OF ORIGIN: 02/02/2023

REVISION # 1

OF PAGES: 25

OCCUPATIONAL HEALTH

Molds

Standard

All employees should be aware of Molds and the effects of exposure.

Molds are microorganisms that produce thousands of tiny particles called spores as part of their reproductive cycle.

Mold colonies are usually visible as colourful, woolly growths. They can be virtually any colour. When disturbed by air movement or handling, molds release their spores.

- Molds can be found almost anywhere.
- Molds usually originate from outside sources such as soil and vegetation.
- Molds prefer dark, moist environments and can grow at room temperature on various construction materials including wallpaper, particleboard, ceiling tiles, drywall, and plywood.

Exposure

- Construction workers can be exposed to toxic spores when working on buildings with some sort of water damage from flooding, plumbing leaks, or leaks in the structure itself.
- In buildings with water damage or ongoing moisture problems, certain types of molds may reproduce to higher than normal levels and potentially cause health effects. *Stachybotrys chartarum* is of particular concern because it can be found in large colonies and can cause adverse health effects.
- *Stachybotrys chartarum* appears as small black patches and grows well on water-soaked cellulose material such as wallpaper, ceiling tiles, drywall, and insulation containing paper.
- In addition, construction personnel working in water-damaged buildings may be exposed to other types of toxic molds such as *Fusarium*, *Aspergillus*, and *Penicillium*.

Contact and Symptoms

- Not all exposed workers will develop symptoms.
- Once released, toxic spores known as mycotoxins must come into contact with the skin or be inhaled before symptoms can develop.
- Exposure to toxic Molds may irritate skin, eyes, nose, and throat, resulting in allergy-like symptoms such as difficulty in breathing, runny nose, and watery eyes.
- Other symptoms have been reported such as fatigue and headache and asthmatic attacks.
- Toxic Molds must be removed. However, special control measures must first be implemented to prevent worker exposure and the spread of mold from one area to another.
- Personal Protective Equipment must be used as directed. Consult the H&S Department.

Note: If mold is discovered in a workplace the control and removal lies with the owner. Contact the H&S Department for further assistance.

Animal Droppings - Histoplasmosis

Standard

Use the following procedures for excavation in ground soils suspected of containing droppings from chickens, pigeons, and bats. Inhaling dust from droppings can cause serious lung infection called histoplasmosis.



HEALTH, SAFETY &
ENVIRONMENTAL PROGRAM

Section: Occupational Health

PREPARED BY: HEALTH AND SAFETY TEAM

DATE OF ORIGIN: 02/02/2023

REVISION # 1

OF PAGES: 25

OCCUPATIONAL HEALTH

Material & Equipment

- Half mask respirator
- High efficiency particulate aerosol (H.E.P.A.) filters
- Disposable coveralls
- Disposable work gloves
- Disposable boot covers
- Duct tape
- Water

Procedure

1. Establish a work area protection zone.
2. In areas not suspected of containing the droppings of chicken's etc., normal excavation methods should be used.
3. Where work is to be performed in an area suspected of containing the droppings of chicken's etc., the following personal protective equipment must be worn:
 - a. Hard hat
 - b. Safety boots
 - c. Eye protection
 - d. Disposable coveralls
 - e. Disposable boot covers
 - f. Half mask respirator with H.E.P.A. filters,
 - g. Disposable work gloves.
4. After putting on the personal protective equipment, and before commencing work, test the respirator for proper fit and seal the pant & sleeve cuffs of coveralls with duct tape.
5. When possible, moisten the ground with water prior to excavation.
6. Upon completion of the work, bag the coveralls, boot covers, gloves, and H.E.P.A. filters and discard.
7. Wash respirator and place it in a sealed container for future use.
8. Rinse hand tools with water prior to storage.

Note: Use of compressed air tools should be limited to reduce the risk of airborne particles including histoplasmosis spores which are inhaled as dust into the lungs.

Note: If mold is discovered in a workplace the control and removal lies with the owner. Contact the H&S Department for further assistance.

Animal Droppings - Histoplasmosis

Standard

Use the following procedures for excavation in ground soils suspected of containing droppings from chickens, pigeons, and bats. Inhaling dust from droppings can cause serious lung infection called histoplasmosis.

Material & Equipment

- Half mask respirator
- High efficiency particulate aerosol (H.E.P.A.) filters



**HEALTH, SAFETY &
ENVIRONMENTAL PROGRAM**

Section: Occupational Health

PREPARED BY: HEALTH AND SAFETY TEAM

DATE OF ORIGIN: 02/02/2023

REVISION # 1

OF PAGES: 25

OCCUPATIONAL HEALTH

- Disposable coveralls
- Disposable work gloves
- Disposable boot covers
- Duct tape
- Water

Procedure

1. Establish a work area protection zone.
2. In areas not suspected of containing the droppings of chicken's etc., normal excavation methods should be used.
3. Where work is to be performed in an area suspected of containing the droppings of chicken's etc., the following personal protective equipment must be worn:
 - a. Hard hat
 - b. Safety boots
 - c. Eye protection
 - d. Disposable coveralls
 - e. Disposable boot covers
 - f. Half mask respirator with H.E.P.A. filters,
 - g. Disposable work gloves.
4. After putting on the personal protective equipment, and before commencing work, test the respirator for proper fit and seal the pant & sleeve cuffs of coveralls with duct tape.
5. When possible, moisten the ground with water prior to excavation.
6. Upon completion of the work, bag the coveralls, boot covers, gloves, and H.E.P.A. filters and discard.
7. Wash respirator and place it in a sealed container for future use.
8. Rinse hand tools with water prior to storage.

Note: Use of compressed air tools should be limited to reduce the risk of airborne particles including histoplasmosis spores which are inhaled as dust into the lungs.

Man-Made Vitreous Fibers (MMVF)

Man-made vitreous fibers (MMVF) or synthetic vitreous fibers (SVFs) are a class of insulating materials. They are made primarily from glass, rock, slag or clay.

Standard

All workers handling or installing Man-Made Vitreous Fibers must take all reasonable precautions to ensure that they are not being exposed. Wearing personal protective clothing and equipment will prevent such exposures.

The Three General Categories

Fiber Glass:

- Glass Wool,
- Continuous Filament



**HEALTH, SAFETY &
ENVIRONMENTAL PROGRAM**

Section: Occupational Health

PREPARED BY: HEALTH AND SAFETY TEAM

DATE OF ORIGIN: 02/02/2023

REVISION # 1

OF PAGES: 25

OCCUPATIONAL HEALTH

Mineral Wool:

- Rock Wool,
- Slag Wool.

Re-factory Ceramic Fibers:

- Pure Oxides
- Kaolin.

Where Used

Fiberglass

- Fiberglass is produced in two basic forms, wool fibers and textile fibers.
- Thermal insulation,
- Noise-control (acoustic) products,
- Linings for air-handling ducts,
- Pipe insulation,
- Air filters,
- Homes
- Refrigerators

Mineral Wool

- Mineral wool includes rock or stone wool and slag wool.
- Materials are sprayed with lubricating oils and binders to reduce dustiness (mineral wool generally contains a very high ratio of nonfibrous particles, or shot) and fiber breakage.
- Mineral wool applications are very similar to those of glass wool-thermal insulation, including fire protection, and acoustic insulation.

Refractory Ceramic Fiber

- Refractory ceramic fiber (RCF) is formulated to help control heat flow in high-temperature, industrial situations.
- Kaolin clay based products, for which the clay is obtained by mining.
- Blends of alumina, silica, and refractory oxides (e.g. chromous and zirconia oxides)
- High-purity products that are a blend of purified alumina and silica and other materials.
- Used in high-temperature, industrial environments.
- Blankets are used as furnace and kiln liners
- Backup insulation to refractory brick, as soaking pit covers
- Annealing welds
- Loose RCF is used as a filler in packing voids and in expansion joints

Health Effects



HEALTH, SAFETY &
ENVIRONMENTAL PROGRAM

Section: Occupational Health

PREPARED BY: HEALTH AND SAFETY TEAM

DATE OF ORIGIN: 02/02/2023

REVISION # 1

OF PAGES: 25

OCCUPATIONAL HEALTH

Skin Irritation

SVFs may irritate the skin. This irritation is a mechanical reaction to sharp, broken ends of fibers that rub or become embedded in the outer layer of the skin and does not appear to be an allergic response. Typically, irritation does not persist and can be relieved by washing exposed skin gently with warm water and mild soap.

Upper Respiratory Tract Irritation

If large amounts of airborne fine fiber are released and improper work practices permit inhalation of the fibers, some workers may experience temporary upper respiratory irritation.

Preventative Exposure Measures

- Whenever possible, SVF products should be engineered and designed to limit their release of airborne dust.
- Manufacturing processes and engineering controls should be used to minimize airborne dust in the work environment.
- Approved respiratory protection and clothing that covers the skin as much as possible when handling or installing SVFs.
- Refer to MSDS for additional information.

Ergonomics (Workplace)

Standard

Ergonomics is the study of the interaction between work and people. Workers in many jobs are at risk for musculoskeletal disorders due to hazards or risk factors in the workplace. An MSD (Musculoskeletal Disorder) is an injury or disorder that occurs over time as a result of repetitive, forceful or awkward body movements or static or awkward postures. These activities can over time result in injury to the muscles and joints.

Musculoskeletal Disorders

Musculoskeletal Disorder (MSD) is also known as Cumulative Trauma Disorder (CTD) and Repetitive Stress Injury (RSI). An MSD can damage muscles, tendons, and nerves of the neck, shoulder, forearm, hands, legs and back. Damage can also occur in other parts of the body. An MSD can cause pain, weakness, numbness or difficulty in grasping objects. Examples includes Back Pain, Carpal Tunnel Syndrome, Bursitis, Trigger Finger, Tendonitis and Rotator Cuff Disorder.

Symptoms of an MSD

- Pain
- Swelling, inflammation
- Numbness or tingling sensation
- Decreased movement of a joint
- Stiffness of body part
- Symptoms worsen with time

Risk Factors of an MSD

Awkward or Static Posture (Prolonged or Frequent)



**HEALTH, SAFETY &
ENVIRONMENTAL PROGRAM**

Section: Occupational Health

PREPARED BY: HEALTH AND SAFETY TEAM

DATE OF ORIGIN: 02/02/2023

REVISION # 1

OF PAGES: 25

OCCUPATIONAL HEALTH

An awkward body posture is any change from a neutral position e.g. bending, stooping, twisting, reaching above the shoulders, reaching behind and bending the wrist forward, backward or side to side.

Repetition

Performing the same motion for too often, too quickly or for too long a period causes stress to joints and muscles. This type of work results in muscle and joint fatigue and can result in injury.

Contact Stress

If the force required for completing the work overloads the muscles, joints and other soft tissues it can cause injury. Excessive force can be created by; long reaches, lifting heavy weights, improper gripping and excessive contact such as carrying a heavy coil of cable over one shoulder.

Local or Hand/Arm Vibration

Risk depends on level and frequency of vibration, length of exposure and whether awkward postures are involved.

Cold Temperatures

Flexibility is decreased, muscles do not work as efficiently. There is decreased blood flow to the muscles and joints.

Hot Work Environments

Can lead to muscle fatigue due to dehydration and errors in how work is performed.

Work Organization and Work Methods

Refers to work pacing, worker rotation and scheduling, potential complacency or monotony of tasks, physical and mental demands of the task, level of training and supervision.

Implementing Controls

General Principles

1. Use handling equipment when possible
2. Avoid lifting loads on or near the floor
3. Minimize working near the floor level
4. Move small weights often rather than heavy weights once
5. Regularly stretch muscles
6. Rotate workers to share monotonous, demanding or repetitive tasks

Specific Controls

Hand Tools

- Choose tools with vibration reducing features
- Choose tools that are lighter and reduce hand torque and kickback
- Make sure tools are balanced and do not require extra muscular effort
- Choose tools with triggers that allow for multiple fingers
- Inspect and maintain tools regularly. Replace old worn tools.



**HEALTH, SAFETY &
ENVIRONMENTAL PROGRAM**

Section: Occupational Health

PREPARED BY: HEALTH AND SAFETY TEAM

DATE OF ORIGIN: 02/02/2023

REVISION # 1

OF PAGES: 25

OCCUPATIONAL HEALTH

Pushing and Pulling

- Make sure handles on carts are adjustable to allow for different worker heights
- Use larger wheels on carts to reduce push or pull forces
- Design work to avoid having to push or pull material up slopes or in crowded spaces
- Push rather than pull carts

Heavy, Frequent and Awkward Lifting

- Use mechanical aids to lift, lower objects/material
- Keep loads close to the body
- Split large loads into smaller loads
- Plan lifting activities including clearing paths of obstacles and paying attention to good housekeeping

Fixed or Awkward Postures

- Adjust height of adjustable work stations
- Use anti-fatigue matting
- Place materials at suitable heights and bring closer to the actual work activity area to avoid long reaches
- When working in cramped positions, allow time to stretch and change position.
- If possible use devices for overhead work.

Repetition

- Implement job rotation
- increase variety of activities
- includes flexibility and encourage micro breaks

Contact Stress

- Change or modify equipment
- Use PPE i.e. knee pads, padded gloves
- Change or modify work practice or work space to reduce contact with sharp or hard edges, surfaces.

Cold Temperatures

- Ensure workers wear appropriate outdoor clothing including well fitting, insulated gloves
- Store tools in warm area if possible while not using
- Provide breaks in warm areas
- Provide portable heating if practical
- Encourage workers to stay hydrated

Warm Temperatures

- Rotate workers to allow for cooling breaks
- Encourage workers to stay hydrated

Work Organization and Work Methods

- Allow rest/recovery from demanding/repetitive tasks



**HEALTH, SAFETY &
ENVIRONMENTAL PROGRAM**

Section: Occupational Health

PREPARED BY: HEALTH AND SAFETY TEAM

DATE OF ORIGIN: 02/02/2023

REVISION # 1

OF PAGES: 25

OCCUPATIONAL HEALTH

- Provide work variability
- Ensure work pace and demands are appropriate
- Provide training on MSDs, hazards and controls

Ergonomics for the Office Environment

Ergonomics can be defined as fitting the job to the worker. All workers are not the same size and everyone has different tolerances and limits. Ergonomics is applied to the design of workstations, work processes, equipment, and tools to fit the worker in order to minimize risk factors that may lead to musculoskeletal injury.

Proper Workplace and Workstation Design

A properly designed workplace helps the worker maintain good body posture and minimizes forces on the body. The workstation should be appropriate for the job and fit the worker's body size and shape.

Standing at Work

Generally the work surface should be at elbow height with the work placed in front of the worker so there is no need to twist or reach. Use of a footrail or footrest allows the worker to shift some of their body weight and rest muscles and joints. Anti-fatigue mats may provide cushioning for hard floors.

Sitting at Work

Chair, desk, computer, or a workbench all affects the worker's body position. The chair should be adjustable so that feet rest comfortably on the floor or on a footrest. Arrange workstation to allow proper back support. (I.e. position keyboard or monitor closer to user). Arm rests should be adjusted to support the forearms and prevent hunching.

"Ideal" Sitting Posture for Computer Work:

- Wrists: Naturally straight position; not bent up, down, or from side to side
- Elbows: Bent between 90° and 100° (right angle), close to your body and supported if possible
- Shoulders: Relaxed (not slouched or raised)
- Neck: Facing forward and not looking up, down, or to either side
- Hips: Bent around 90° with your thighs roughly parallel to the floor
- Low Back: Supported to maintain its natural curve
- Knees: Bent at about 90° with enough space between the back of your knees and the chair to place your fist
- Feet: Placed flat on the floor or supported by a footrest.

Preventing MSD's in the Office

- Workers should stand up and get away from the desk and/or computer regularly throughout the day.
- Muscles work best when the body joints are in "neutral" positions. Workers should not remain in any one position (seated or otherwise) for long periods of time.
- Getting up and walking around, even short distances, throughout the day helps to reduce stress by improving circulation in the muscles and the spine.
- Micro-breaks are useful to allow muscles and joints a rest. Other daily tasks, such as filing and delivering, can be done while taking a break away from the computer.



**HEALTH, SAFETY &
ENVIRONMENTAL PROGRAM**

Section: Occupational Health

PREPARED BY: HEALTH AND SAFETY TEAM

DATE OF ORIGIN: 02/02/2023

REVISION # 1

OF PAGES: 25

OCCUPATIONAL HEALTH

Chair Position

- Adjust the backrest so the low back support contacts the curve in the back and gives support in that area.
- Adjust armrests so that elbows can rest comfortably on the rests, and shoulders are level and relaxed
- Lower the seat pan so feet rest comfortably on the floor.
- Chair height should be adjusted to allow for typing comfortably with “ideal” wrist and arm positions. A footrest can be used if feet do not rest flat on the floor after chair adjustment.

Keyboard and Mouse

- Keyboard and mouse should be slightly below elbow level and close to the body. The mouse should be right beside the keyboard, and in front of the mousing hand.
- To reduce stress on the hand, try to use the mouse with the opposite hand. This reduces the stress placed on one arm and frees the dominant hand to perform other tasks.
- Try moving the arm and shoulder rather than only the hand when mousing.

Monitor and Document Holder

- Document holders help keep papers vertical or angled so the neck does not have to bend to read them.
- The document holder should be the same distance from the eyes as the computer screen.
- The monitor and keyboard should be directly in front of the worker.
- The top of the monitor and document holder should be around eye level when sitting comfortably.
- The monitor should be about arm’s length away at a comfortable reading distance.
- The monitor should be angled slightly up toward the eyes. Angling the monitor up too high can increase glare.
- Eyesight naturally falls about 20° down from the horizontal, the top of the screen should be placed around eye level. Line of sight should naturally fall to the middle of the screen.
- If the worker wears bifocals or trifocals, it's especially important to properly adjust monitor height. Tilting the head back to view the screen through the lower portion of the glasses could lead to muscle fatigue in the neck and back. Instead, try lowering the monitor.

Back Care Standard

Construction work puts physical stress on the body. About half of the back injuries are attributed to lifting excessive weight or lifting incorrectly and the rest are the result of slips, trips and falls. Most back injuries are the result of everyday wear and tear rather a single traumatic event.

Procedure

Exercise Program to protect your spine, the muscle supporting your back must be both strong and flexible. A pre-work stretching program is recommended. Warming up prepares your body for the physical work ahead and helps minimize the risk of injury.

The three essentials are Warm-up, Workout, and Cool-Down.

Remember – Check with your doctor before starting any exercise program.



**HEALTH, SAFETY &
ENVIRONMENTAL PROGRAM**

Section: Occupational Health

PREPARED BY: HEALTH AND SAFETY TEAM

DATE OF ORIGIN: 02/02/2023

REVISION # 1

OF PAGES: 25

OCCUPATIONAL HEALTH

- Workplace Posture
 - Maintaining a proper posture is the most critical part of good back care. Using our muscular system to control posture minimizes the effects of everyday wear and tear on our spine. Any position held too long is not good for your back. Aches and pains from prolonged working postures are our body's way of warning you to change position. If these warnings are continuously ignored, you will be vulnerable to low back injury.
- Lifting
 - A weight that is too heavy, lifting in awkward position, twisting your body while lifting, or doing excessively heavy work are all common causes of low back problems. When lifting plan your move, size up the load and make sure your path is clear or get help if needed or use other material handling equipment if possible.
 - Material Handling Equipment
 - Different types of equipment have been designed and manufactured to lift and move loads of various shapes, sizes, and weights. This equipment can not only save time and labor – it can save your back.
 - Hoisting or Moving Heavy Loads
 - Special equipment is often required to hoist or move heavy loads manually. Devices from simple levers and rollers to more complicated chain hoists and derricks can handle loads that would otherwise be difficult to move. The mechanical advantage afforded by this equipment reduces the manual effort involved as well the risk of back injury.

Hand-Arm-Vibration Standard

All employees exposed to tools that vibrate need to be aware of Hand-Arm-Vibration Syndrome (HAVS) and the effects.

Hand-Arm-Vibration is the transfer of vibration from a tool to a worker's hands and arms. The level of Hand-Arm-Vibration is determined by measuring the acceleration of the tool or object grasped by the worker.

Hand-arm vibration syndrome is a disease that involves circulatory disturbances, sensory and motor disturbances and musculoskeletal disturbances.

Exposure

Daily exposure to hand and arm vibration by workers who use vibrating tools powered by compressed air, gasoline or electricity (eg. powered hammers, jackhammers, chisels, chainsaws, sanders, grinders, riveters, breakers, drills, compactors, sharpeners and shapers) can cause physical damage to the hands and arms.

Symptoms

- Bluish discoloration (cyanosis) of the skin of fingers and hands.
- Whitening (blanching) of fingertips after cold or damp exposure (known as Raynaud's phenomenon).
- Numbness, with or without tingling happens, before, during or after blanching.
- Attacks, more common in winter, but eventually may occur year round.
- Palms of the hands are rarely affected.
- Sense of touch and pain perception reduced, sometimes forever.



HEALTH, SAFETY &
ENVIRONMENTAL PROGRAM

Section: Occupational Health

PREPARED BY: HEALTH AND SAFETY TEAM

DATE OF ORIGIN: 02/02/2023

REVISION # 1

OF PAGES: 25

OCCUPATIONAL HEALTH

- Decreased grip strength, and inability to sustain muscle power.

Prevention:

Reducing the incidence of HAVS requires numerous actions. Some recommendations to prevent HAVS are:

- Provide adequate rest breaks away from vibrating tools (e.g. Reduce exposure hours, decrease the number of days exposed to vibrating tool by job rotation).
- Follow manufactures instructions on proper use of equipment. (e.g. Do not remove hand grips on grinders).
- Design tools to minimize vibration.
- Design tools to keep hands warm (e.g. Heated handles, relocate air vents).
- Use ergonomic design to reduce grip force, awkward posture, etc.
- Perform routine medical checks of those at risk. Record all signs and reported symptoms.
- Warn workers of health risks.

NOTE: There is no therapy at present for neurological symptoms other than removal from vibration exposure, but improved circulation may help with nerve recovery.