

ABTREX INDUSTRIES, INC.

Corrosion & Abrasion Resistant Fabrications, Linings & Coatings

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MANUAL OF SAFETY AND ENVIRONMENTAL PROCEDURES AND POLICIES

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CONFINED SPACE ENTRY PROCEDURE

1. PURPOSE

- 1.1 To protect all affected personnel from the hazards of entry into permit-required confined spaces.

2. SCOPE

- 2.1 All Abtrex employees are required to comply with all federal, state, and local laws and further comply with OSHA 1910.146 standard.
- 2.2 All Abtrex employees, at minimum, will comply with OSHA 1910.146 (C) (9) (i-iii), and in addition, will fully coordinate and comply with our customer's permit space requirements.

3. CONFINED SPACE DEFINITIONS

Acceptable Entry Conditions – The conditions that must exist in a permit-space to allow entry and to ensure that employees involved with a permit-required confined space entry safely enter into and work within the space.

Attendant – An individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all attendant's duties assigned in the employer's permit-space program.

Blanking or Blinding – The absolute closure of a pipe, line or duct by the fastening of a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore and is capable of withstanding the maximum pressure of the pipe, line or duct with no leakage beyond the plate.

Confined Space – A space that:

1. Is large enough and so configured that an employee can bodily enter and perform assigned work; and
2. Has limited or restricted entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry and exit); and
3. Is not designed for continuous employee occupancy.
 - a) Confined Space – Tanks, tubs, vessels, or other confined spaces with one side open to the air, but so deep (greater than 5 feet) as to require entrance and aid of an assistant in case of emergency.
 - b) Confined Enclosed Space – Tanks, tubs, vessels, or other confined spaces that are totally enclosed having only one or two access manways and limited means for ventilation, exit and egress.

3

Double Block and Bleed – The closure of a line, duct, or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.

Emergency – Any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit space that could endanger entrants.

Engulfment – The surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be breathed in and can cause death by filling or plugging the respiratory system; or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

Entry – The action by which a person passes through an opening into a permit-required space. Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

Entry Permit – See attached Confined Space Entry Checklist, Abtrex Form 5668 or Confined Enclosed Space Entry Checklist, Abtrex Form 5669.

Entry Supervisor – The person (such as the employer, foreman, or other trained individual) responsible for determining if acceptable entry

conditions are present at a permit-space where entry is planned; for authorizing entry and overseeing entry operations; and for terminating entry as required by this program.

NOTE: An entry supervisor also may serve as an attendant or as an authorized entrant, as long as that person is trained and equipped as required by this program for each role he or she fills. Also, the duties of the entry supervisor may be passed from one individual to another during the course of an entry operation.

Hazardous Atmosphere – An atmosphere that may expose employees to the risk of death, incapacitation, and impairment of the ability to self-rescue (that is, escape unaided from a permit space), injury, or illness from one or more of the following causes:

1. Flammable gas, vapor, or mist in excess of 10% of its lower explosive limit (LEL).
2. Airborne combustible dust at a concentration that meets or exceeds its LFL. LFL stands for lower flammable limit. LFL is a measurement of the concentration of combustible dust required to sustain a fire or explosion in the presence of an ignition source. i.e., grain dust.
3. Atmospheric oxygen concentration below 19.5% or above 23.5%.
4. Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in Subpart Z, Toxic and Hazardous Substances and in Subpart G, Occupational Health and Environmental Control (29 CFR 1910), and that could result in employee exposure in excess of its dose or permissible exposure limit.
5. Any other atmospheric condition that is immediately dangerous to life or health.

NOTE: For air contaminants for which OSHA has not determined a dose or permissible exposure limit, other sources of information, such as Material Safety Data Sheets that comply with the Hazard Communication Standard, 29 CFR 1910.1200, published information, and internal documents can provide guidance in establishing acceptable atmospheric conditions.

Hot Work Permit – The employer's written authorization to perform operations (for example, riveting, welding, cutting, burning, and heating) capable of providing a source of ignition.

Immediately Dangerous to Life or Health (IDLH) – Any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit space.

NOTE: Some materials, like hydrogen fluoride gas and cadmium vapor, for example may produce immediate transient effects that, even if severe, may pass, without medical attention, but are followed by a sudden, possibly fatal collapse 12 to 72 hours after exposure. The victim "feels normal" from recovery from transient effects until collapse. Such materials in hazardous quantities are considered to be "immediately" dangerous to life or health.

Inerting – The displacement of the atmosphere in a permit-space by a non-combustible gas (such as nitrogen) to such an extent that the resulting atmosphere is non-combustible.

NOTE: This procedure produces an IDLH oxygen-deficient atmosphere.

Isolation – The process by which a permit-space is removed from service and completely protected against the release of energy and material into the space by such means as: blanking or blinding; misaligning or removing sections of lines, pipes, or ducts; a double block and bleed system; lock-out or tag-out of all sources of energy; or blocking or disconnecting all mechanical linkages.

Line Breaking – The intentional opening of a pipe, line, or duct that is or has been carrying flammable, corrosive, or toxic material, an inert gas or a fluid at a volume, pressure, or temperature capable of causing injury.

Non-Permit Confined Space – A Confined Space that does not contain or with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

Oxygen-Deficient Atmosphere – An atmosphere containing less than 19.5% oxygen by volume.

Oxygen-Enriched Atmosphere – An atmosphere containing more than 23.5% oxygen by volume.

Permit-Required Confined Space (Permit Space) – A Confined Space that has one or more of the following characteristics:

- Contains or has a potential to contain a hazardous atmosphere.
- Contains a material that has the potential to engulf an entrant.

- Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross-section.
- Contains any other recognized serious safety or health hazard.

Permit-Required Confined Space Program (Permit Space Program) – The employer’s overall program for controlling, and, where appropriate, for protecting employees from permit-space hazards or for regulating employee entry into permit-spaces.

Retrieval System – The equipment (including retrieval line, chest, or full body harness, wristlets (if appropriate), and lifting device or anchor) used for non-entry rescue of persons from permit-spaces.

4.0 TRAINING OF PERSONNEL

- 4.1 Responsibility** – The Safety Director is responsible for the training of employees participating in or exposed to injury by confined space entry operations.
- 4.2 Trainees** – Shall include all employees who expect to enter enclosures, serve as attendants, and supervisors likely to be involved in confined space operations. Any employee performing these functions shall be trained.
- 4.3 Training Program** – Training shall be administered by the Safety Manager

5.0 PROCEDURES

- 5.1 Unauthorized Entry** – In order to prevent unauthorized entry into a confined space, all employees and contractors must be notified if there is any permit – required confined spaces in the workplace by isolating, posting the appropriate danger signs and making available the written permit space entry program to employees and contractors.
- 5.2 Entry** – Entry into the space can take place after:
- It has been determined safe to remove any entrance cover.
 - Any openings are guarded to protect against falling and falling objects.
 - Internal atmosphere testing.
 - Air remains without hazard whenever any employee is inside the space.
 - Continuous forced air ventilation has eliminated any hazardous atmosphere.
 - Space is tested periodically.

- All power and equipment are locked out.
- 5.3 Exit Immediately** – Employees must exit immediately if a hazardous atmosphere is detected during entry and the space must be evaluated to determine how the atmosphere developed.
- 5.4 Observation of Monitoring Equip.** – Each authorized entrant of a permit required confined space shall be provided the opportunity to observe any monitoring or testing of permit spaces.
- 5.5 Maintenance** – All employees are to be trained in proper use and maintenance of all safety and rescue equipment to ensure that employees use that equipment properly.
- 5.6 Ventilation** – Proper ventilation is the real key for working safely in enclosed spaces. Adequate ventilation will remove solvent vapors as they are generated in confined spaces and in so doing, remove the possibility of fire and/or explosion. After the confined space is properly ventilated, the mechanical ventilation equipment shall be kept operating to provide secondary protection in case of accidental introduction of harmful chemicals, or to remove contamination that may be produced by work in the confined space, such as welding and cutting, painting, coating, or to otherwise improve working conditions. Depending on the configuration of a tank's outlets and manhole openings ventilation may give the illusion that fresh air is being circulated evenly and chemical or solvent fumes are being removed. This may not be the case because most solvent vapors/fumes, such as methyl ethyl ketone and toluene, are heavier than air, and will collect in the bottom of a confined space if allowed. Conversely, other fumes like methane are lighter than air and will collect in the top. In light of this fact, all ventilating fans, Coppus Blowers, and exhaust sources should be used with this caution in mind.
- 5.7 Tank/Equipment Grounding** – All tanks and equipment, in which our employees will be working, shall be grounded with an equipment grounding conductor, preferably connected to the building grounding system. All paint and corrosion that might prevent continuity shall be removed.
- 5.8 Proper Respirator Protection** – The following is offered with the intent to protect our employees' health.

<u>SPACE</u>	<u>WORK ACTIVITY</u>	<u>VENTILATION</u>	<u>RESPIRATOR</u>
Confined Space (Open Top)	Adhesive Application for full rubber lining, painting, or FRP.	Yes	Cartridge
Confined Enclosed	Welding, rubber patching or FRP.	Yes	Cartridge
Confined Enclosed	Adhesive application for full rubber lining or painting.	Yes	Supplied Air

Respirator selection may be a judgment call depending on circumstances. At times, respirator selection will be directed by the customer. For further questions, consult our Respirator Program.

- 5.9 Testing** – When performing any work involving painting, application of adhesives or other protective coatings, testing is required on an interim basis (as often as necessary) while the work is in process to determine presence of flammable or toxic vapors, excess oxygen, oxygen deficiency, or toxic gas. Guidelines for determining a minimally acceptable respirable atmosphere are: oxygen 19.5% - 23.5%, carbon monoxide <50 ppm, and combustible gas 10% or less of the lower explosive limit (LEL) and the lower flammable limit (LFL). If any detectable amount of a combustible is present or the percentage of oxygen is above or below 23.5% and 19.5%, ventilation should be continued to maintain a respirable atmosphere.
- 5.10 Rescue** – During a confined space entry, our employees will perform the required procedures as listed on Abtrex Form #5668 and #5669. However, we do not provide rescue in the event of an emergency and require that rescue procedures be provided by our on-site customer. As stated in our confined enclosed space entry checklist Form #5669, we require that emergency procedures be understood by all participants, especially the chain of communication between our employees and customer's emergency personnel.

 - 5.10.1 First Aid/CPR** – In the event of a medical emergency at any of our three plant locations, our employees are trained to notify the foreman and follow our emergency response plan for subsequent action. While in the field, our foreman will be notified of any medical emergencies and, in turn, will contact our customer for medical services.
- 5.11 Responsibility** – While working on site at a customer's plant, our employees will at minimum, follow the standards set by our program. In the event a customer mandates that we follow their safety procedures, they must exceed our safety procedures and standards. When we are instructed to adhere to a customer's safety procedures, our job-site foreman has the responsibility of making sure we conform and will require our customer to perform all duties and activities specified. If the customer fails to execute their responsibilities to our satisfaction, then our job-site foreman has the authority to stop work, until such a time that the customer conforms to our requirements.
- 5.12 Permit vs. Non-Permit Entry** – According to OSHA 1910.146, a confined space (which we have previously defined), must be classified as permit-required or not. Of the 4 characteristics that define a permit-required space, the one that most concerns Abtrex

is “Contains or has a potential to contain a hazardous atmosphere.” These criteria will be used when deciding whether an entry will require a permit or not.

- 5.13 Reclassification of Confined Spaces** – During tank fabrication at our home shop, open top rectangular tanks will be reclassified as non-permit confined space. This will be accomplished by laying tank on its side. Per 29CFR 1910.146 (c) (7), this action will eliminate potential atmospheric and all other hazards.
- 5.14 Alternate Procedures of Confined Space** – At our home shop, cylindrical closed end tanks may be entered with the following procedures described below per 29CFR 1910.146 (c)(5)(ii):
- 5.14.1** During the lining process:
- Continuous forced air ventilation
 - Initial atmospheric monitoring only
 - Periodic atmospheric monitoring if ventilation stops for any reason
 - Written certification for each tank must be issued and kept on file for (1) year containing: the date, customer and tank size, signature of person certifying tank safety
- 5.15 Lighting** – In accordance to OSHA 1910.146(d) (v) Lighting equipment is required only when lighting is insufficient to enable employees to see well enough to work safely and to exit the space quickly in an emergency.
- 5.16 Barriers and Shields** – Any openings are to be guarded to protect against falling and falling objects.

If the space (confined or confined enclosed) can be entered without a permit, then the following checklist must be followed: Non-Permit Confined Space Entry Checklist, Abtrex Form #5668.

If the space (confined or confined enclosed) requires a permit in order to enter, use our Confined Space Entry Checklist, Abtrex Form #5669.

ABTREX INDUSTRIES, INC.

CONFINED SPACE ENTRY CHECK LIST

NON – PERMIT REQUIRED ABTREX FORM 5668

JOBSITE: _____

CONFINED SPACE I.D. _____

DATE: _____

CHECK EACH ITEM TO CONFIRM REVIEW

PREPARATION PROCEDURES:

- 1) CONFINED SPACE CLEANED OUT _____
- 2) CONFINED SPACE VENTILATED _____
- 3) SPARK HAZARD/HOT WORK PERMIT REQUIRED _____
- 4) MECHANICAL MECHANISMS LOCKED OUT, TAGGED OUT _____
- 5) ALL PROCESS LINES DISCONNECTED OR BLANKED OFF _____
- 6) ATMOSPHERE CHECK REQUIREMENTS
 - a) OXYGEN CONTENT – min/max (19.5%/23.5%) _____
 - b) COMBUSTIBLE GAS (non – existent) _____
 - c) TOXIC GAS (non – existent) _____
- 7) RESPIRATOR REQUIRED _____
 - a) TYPE OF CARTRIDGE _____

SIGNATURES: _____

ABTREX INDUSTRIES, INC.

CONFINED SPACE ENTRY CHECK LIST

ABTREX FORM 5669

JOBSITE: _____

CONFINED SPACE I.D. _____

DATE: _____

CHECK EACH ITEM TO CONFIRM REVIEW

PREPARATION PROCEDURES:

- 1) CONFINED SPACE CLEANED OUT _____
- 2) CONFINED SPACE VENTILATED _____
- 3) SPARK HAZARD/HOT WORK PERMIT REQUIRED _____
- 4) MECHANICAL MECHANISMS LOCKED OUT, TAGGED OUT _____
- 5) ALL PROCESS LINES DISCONNECTED OR BLANKED OFF _____
- 6) ATMOSPHERE CHECK REQUIREMENTS
a) OXYGEN CONTENT – min/max (19.5%/23.5%) _____
- b) COMBUSTIBLE GAS (10% OR LESS) _____
- c) TOXIC GAS - CO (LESS THAN 50ppm) _____
- d) OTHER _____
 - _____ PEL _____
 - _____ PEL _____
 - _____ PEL _____
- e) CONTINUOUS TESTING/MONITORING REQUIRED for a through c _____
- 7) PROTECTIVE EQUIPMENT AND RESCUE EQUIPMENT _____
 - a) TRIPOD WITH L/A/R DEVICES _____
 - b) HARNESS ON PERSON ENTERING _____
 - c) RETRIEVAL LINE ON HARNESS _____
 - d) SUPPLIED AIR RESPIRATOR ON ENTRANT _____
 - e) CARTRIDGE RESPIRATOR ON ENTRANT _____
 - f) HARNESS NEAR WATCH PERSON _____
 - g) EXTRA LENGTH OF RETRIVAL LINE NEAR WATCH PERSON _____
 - h) SUPPLIED AIR RESPIRATOR NEAR WATCH PERSON _____
 - i) SPEACIAL PPE _____

8) VENTILATION MAINTAINED INSIDE VESSEL DURING OPERATIONS _____

9) EMERGENCY PROCEDURES UNDERSTOOD BY ALL PARTICIPANTS _____

SIGNATURES:

10) PERSON ENTERING _____

11) WATCH PEERSON _____

12) SUPERVISOR AUTHORIZING ENTRY _____

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ELECTRICAL SAFETY PROGRAM

1.0 PURPOSE

- 1.1 To protect our employees from electrical hazards and electrical energy sources that could result in injury.

2.0 DEFINITIONS

Grounding - Means a conductive connection to earth that offers sufficiently low resistance and has sufficient current carrying capacity to prevent the buildup of voltages that may result in a personal hazard.

GFCI - (Ground Fault Circuit Interrupters): An in-line circuit interrupter that is designed to shutoff electric power within as little as 1/40 of a second. The GFCI interrupts the current quickly enough to prevent electrocution.

Hazardous Locations - A specific location, such as a tank or vessel, that may contain flammable gases or vapors resultant of our lining process and may become hazardous if ventilation is ineffective.

- Class I, Division 2 – A location in which ignitable concentrations of gases or vapors are normally prevented by positive mechanical ventilation, and which might become hazardous through failure or abnormal operations of the ventilating equipment.

3.0 TEMPORARY WIRING METHODS

3.1 General Requirements

- 3.1.1 Extension cords shall be used only in continuous lengths without splices.

- 3.1.2 Ground-Fault Circuit Interrupters (GFCI's) shall be installed on all 110-120 volt circuits in high-risk areas, such as wet locations. Decisions concerning when to use GFCI's shall be made on a job to job basis.
- 3.1.3 No wiring system of any type shall be installed in ducts used to transport dust, loose stock, or flammable vapors.
- 3.1.4 All receptacles shall be of the grounding type.
- 3.1.5 All conductors shall be run as multiconductor cord or cable assemblies and shall be protected by overcurrent devices at their ampacity.
- 3.1.6 All lamps for general illumination shall be protected from accidental contact or breakage.
- 3.1.7 Flexible cords and cables shall be protected from damage by sharp corners and pinch points.
- 3.1.8 Extension cords used with portable electric tools and equipment shall be of the three-wire type and shall be designed for hard or extra-hard usage.
- 3.1.9 Only extension cords meeting ANSI standards shall be used.

4.0 PORTABLE ELECTRIC TOOLS AND EQUIPMENT

4.1 Inspection of Equipment

- 4.1.1 All Abtrex power tools shall be maintained in a safe condition. Any defective or damaged items, which may expose our employees to harm, shall be removed from service until repairs and tests render them safe for use.
- 4.1.2 Electric power operated tools shall either be equipped with a three-wire cord having the ground wire permanently connected to the tool frame or be of the double-insulated type and permanently labeled as "double insulated."

5.0 WELDING EQUIPMENT AND SAFEGUARDS

5.1 Manual Electrode Holders

- 5.1.1 Only manual electrode holders, which are specifically designed for arc welding and cutting, and are of a capacity capable of safely handling the maximum rated current required by the electrodes, shall be used.
- 5.1.2 Any current-carrying parts passing through the portion of the holder, which the user grips in his hand, and the outer surfaces of the jaws of the holder, shall be fully insulated against the maximum voltage encountered to the ground.
- 5.1.3 All arc welding and cutting cables shall be of the completely insulated, flexible type, capable of handling the maximum current requirements of the work in progress, taking into

account the duty cycle under which the arc welder or cutter is working.

- 5.1.4 Only cable free from repair or splices for a minimum distance of ten feet from the cable and to which the electrode holder is connected shall be used. Cables with standard insulated connectors or with splices whose insulating quality is equal to that of the cable are permitted.

6.0 ELECTRICAL SAFETY IN HAZARDOUS LOCATIONS

- 6.1 Electrical equipment, namely electric power tools and lights, shall be approved as safe or approved for the hazardous (classified) location.
- 6.2 Regardless of why or how a location is hazardous, it is necessary that every precaution be taken to guard against ignition of the atmosphere.
- 6.3 When our employees are priming, cementing, or spray painting the inside of a tank or vessel, explosion-proof lights and equipment shall be used.

7.0 SAFETY RELATED WORK PRACTICES

- 7.1 Deenergizing Electrical Equipment: Before our employees perform any type of work, all electrical equipment owned and operated by our customer and associate with our work, will be turned off, locked out, and tagged. The current supplying this equipment will be turned off at the switch box and the switch padlocked in the off position. For instruction in specific lockout/tagout procedures refer to our Lockout/Tagout Program.
- 7.2 When working at a customer's site, all overhead power lines that may interfere (within ten feet) with our employee's work must be deenergized and grounded by our customer or operator of the lines. If the power lines must remain energized, protective measures (such as guarding or insulating the line) must be designed to prevent our employees from contacting the lines.
- 7.3 Our employees and mechanical equipment like scissor lifts or mobile lifting platforms must stay at least ten feet (3.05 meters) away from overhead power lines. If the voltage is more than 50,000 volts, the clearance must be increased by 4" (10 centimeters) for each additional 10,000 volts.
- 7.4 Extension cords shall not be fastened with staples, hung from nails, or suspended by wire.

8.0 TRAINING

- 8.1 Training will include information about the following topics:

- Lockout/Tagout
- Electrically safe work practices
- Electrical hazards in the workplace
- Pertinent topics from 29CFR 1910 Subpart S

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FALL PROTECTION PROGRAM

1.0 PURPOSE

- 1.1 To protect our employees from injuries associated with falls that may occur at our shop or at customer's facilities.

2.0 DEFINITIONS

Body Belt or Safety Belt - A strap with means both for securing it about the waist and for attaching it to a lanyard, lifeline, or deceleration device. As of January 1, 1998, the use of a body belt for fall arrest is prohibited.

Body Harness - Straps which may be secured about the employee in a manner that will distribute the fall arrest forces over at least the thighs, pelvis, waist, chest and shoulders, with means for attaching it to other components of a personal fall arrest system.

Controlled Access Zone (CAZ) - An area in which certain work may take place without the use of guardrail systems, or personal fall arrest systems. Access to the zone is controlled.

Control Line - A line flagged at six-foot intervals, which restricts access to a controlled access zone.

Deceleration Device - Any mechanism such as a rope grab, rip-stitch lanyard, specially-woven lanyard, tearing or deforming lanyards, automatic self-retracting lifelines/lanyards, etc., which serves to dissipate a substantial amount of energy during a fall arrest, or otherwise limit the energy imposed on our employees during fall arrest.

Guardrail System - A barrier erected to prevent our employees from falling to lower levels.

Lanyard - A flexible line of rope, wire rope, or strap which generally has a connector at each end for connecting the body belt or body harness to a deceleration device, lifeline, or anchorage.

Lifeline - A component consisting of a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline), or for connection to anchorages at both ends to stretch horizontally (horizontal lifeline), and which serves as a means for connecting other components of a personal fall arrest system to the anchorage.

Personal Fall Arrest System - A system used to arrest an employee in a fall from a working level. It consists of an anchorage, connectors, body harness, and may include a lanyard, deceleration device, lifeline, or suitable combination of these.

Walking/Working Surface - Any surface, whether horizontal or vertical, on which an employee walks or works, including, but not limited to, floors, roofs, ramps, bridges, runways, tank tops and floors, but not including ladders, vehicles, or trailers on which employees must be located in order to perform their job duties.

3.0 GENERAL WORK ENVIRONMENT

- 3.1 All Abtrex work areas, both shop and field, will be clean and orderly. Aisles and passageways shall be kept clear.
- 3.2 Spilled materials must be cleaned immediately and disposed of properly.
- 3.3 All work areas must be adequately illuminated.
- 3.4 The following rules apply to all Abtrex employees:
 - Walk – do not run.
 - Grip handrails at all times when using stairs.
 - Ascend or descend stairways one step at a time.

4.0 PROTECTION FROM FALLING OBJECTS

- All Abtrex employees potentially exposed to injury from falling objects are required to wear hard hats.

- A toeboard shall be erected along the edge of scaffolding platforms more than ten feet above lower levels for a distance sufficient to protect our employees below.
- Where toeboards are not feasible and there is a potential for falling objects to cause injury, our employees may barricade the area to which objects could fall, and prohibit employees/people from entering the barricaded area.

5.0 SAFETY REQUIREMENTS FOR FALL PROTECTION

- Our Fall Protection Program is structured in accordance with OSHA 29 CFR 1926, subpart M, Fall Protection.
- All Abtrex employees walking or working on a surface which is six feet or more above a lower level will be protected from falling by the use of guardrail systems or personal full body safety harnesses and shock absorbing lanyards for the following exposures:
 - Unprotected sides and edges
 - Ramps, runways and other walkways
 - Holes
 - Tank Tops
 - Wall Openings
 - Scaffolding (Ten feet or more above a lower level)
 - Any walking/working surface not otherwise addressed and deemed unsafe by our job-site foreman

- Criteria for guardrail systems:

Our requirements for guardrail systems include a top rail located 42" above the walking/working level, and a midrail located near 21" above the walking/working level. The guardrail system should have the ability to withstand a force of at least 200 lbs. in any outward or downward direction. For cross-reference please consult our Scaffolding Program.

- Criteria for fall arrest systems:
 - Connectors, deceleration devices, D-rings, snaphooks, lanyards, lifelines and anchorages will be designed, constructed and installed according to specifications addressed in OSHA 1926.502(d)(1-15).
 - Limit maximum arresting force on our employees to 1,800 pounds when used with a body harness.

- Rigged such that an employee can neither free fall more than six feet nor contact any lower level.
- Harnesses and related components shall be used only for employee fall protection and not to hoist materials.
- Personal fall arrest systems and components subject to inservice loading shall be removed from service until inspected and approved for use by a competent person.
- **Controlled Access Zone Policy:**
 - When working on site at a customer's plant, our employees may not be allowed to work in a Controlled Access Zone, as defined. Out of concern for our employee's safety, guardrails or fall arrest systems should be deployed in lieu of control lines. Our job-site foreman will address any questions on this matter in a responsible manner.
- **Fall Arrest System Anchorage Points (Scaffolding):**
 - Personal fall arrest systems shall be attached by lanyard to either a vertical lifeline, horizontal lifeline, or secure anchorage independent of the scaffold.
 - When vertical and horizontal lifelines are used, they shall be fastened to a fixed safe point of anchorage, shall be independent of the scaffold and shall be protected from sharp edges and abrasion. Safe points of anchorage include structural members or tanks and buildings, but do not include standpipes, vents, piping systems, or anything potentially unable to carry the load.
 - When working on site at a customer's plant, our experienced employees may assemble and dismantle our Fall Protection System simultaneously with the scaffolding. In some instances, where the Fall Protection System becomes complex, we will employ the consulting services of a Safety Engineer.

6.0 TRAINING

6.1 Training will include information about the following topics:

- The nature of fall hazards in the work area.
- The correct procedure for erecting, maintaining, disassembling, and inspecting the fall protection systems to be used.

- The use and operation of guardrail systems and personal fall arrest system.
- The standards contained in OSHA 29CFR 1926, subpart M, Fall Protection.

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OSHA HAZARDOUS COMMUNICATION PROGRAM

Abtrex Industries, Inc. and every other manufacturing company that uses chemicals is required by the OSHA Hazardous Communication Standard (29CFR1910.1200) to establish a written communication program which includes provisions for container labeling, Material Safety Data Sheets, and information and training for employees exposed to hazardous chemicals in each work area. The Standard provides the written program must include a list of hazardous chemicals in each work area, methods used to instruct employees in the hazards of non-routine tasks, the hazards associated with chemicals in unlabeled pipes where used, and the way contractors will be informed of hazards to which their employees may be exposed while working in our plant facilities. The program must be available to employees, their designated representatives, OSHA and NIOSH.

Labels and Other Forms of Warning

The standard requires in each covered workplace containers of hazardous chemicals must be labeled, tagged, and marked with the identity of hazardous chemicals contained therein, and must show hazard warnings appropriate for employee protection. The warning can be any type of message, words, pictures or symbols which convey the hazards of the chemical(s). Labels must be legible in English and prominently displayed.

Material Safety Data Sheets

Abtrex Industries, Inc. and other employers covered by the Standard are responsible for obtaining a Material Safety Data Sheet (MSDS) for each hazardous chemical used in their workplaces. The MSDS's supplied by the manufacturer of the material must contain: (1) Product name and identification; (2) Hazardous ingredients of mixtures; (3) Physical data and characteristics; (4) Fire and explosion hazard(s); (5) Health hazards, exposure limits, and symptoms of exposure; (6) Reactivity; (7) Protective equipment recommended for use; (8) Spills, leaks and disposal; and (9) Storage and handling. Copies of the MSDS for hazardous chemicals in a given work site are to be readily accessible to employees in that area. As a source of detailed information on hazards, MSDS's

must be located close to workers and readily available to them during each workshift.

Employee Information and Training

Employers must inform employees about potential hazards and train them in the methods of protection. Abtrex Industries, Inc. and every manufacturing company that uses chemicals, has to let employees, and all persons who might enter the workplace and be exposed to hazardous substances, know about the hazards that they might encounter. The Hazard Communication Program must include information and training for employees exposed to hazardous chemicals in their work area.

- a) Criteria for development and implementation of the written program.
 1. All suppliers of hazardous chemicals will be instructed by Abtrex to properly label, tag, or mark the proper identity and warning for the hazardous chemicals supplied.
 2. Abtrex will use signs, placards, or stenciling to identify the hazardous chemicals.
 3. Abtrex will obtain Material Safety Data Sheets (MSDS) for each hazardous chemical they use. These sheets will be kept in an employee informed
 4. Designated area at each plant location, readily accessible during each work shift to employees when they are in their work area.
 5. Abtrex will provide the proper community officials a copy of our MSDS sheets for all hazardous materials we use in order to allow them to train their employees.

- b) Training
 1. Training of the employees will be conducted at the time of their initial job assignment and whenever a new hazard is introduced into their work area. New employees, or employees who have not been trained previously, will receive training equivalent to the initial assignment training required when the standard took effect. All training will be conducted by a designated representative of the company.
 2. Abtrex will use the following procedure(s) to train its employees:
 - Explain to the employee the requirements of CFR 1910.1200.
 - Explain the labeling system of hazardous substances.

- Inform the employees where to find information about the hazardous chemicals being used.
- Make employees aware of where to look for warnings and instructions of the hazardous chemicals, as well as explaining to the employees how to understand and abide by these warnings and instructions.
- Abtrex will go over and thoroughly explain their MSDS sheets for all hazardous substances used in the workplace. This includes telling them where the MSDS sheets are located and how the hazard information on them is to be used.
- Employees will be informed of all methods and observations Abtrex will use to detect the presence or release of a hazardous chemical in the work area.
- The employees will be informed of the physical and health hazards of the chemicals in the work place.
- All employees will be trained on how to protect themselves from any chemical hazards.
- All employees will be instructed on how to protect themselves from exposure to hazardous chemicals, such as the proper work practices, what emergency procedures to use if exposure occurs, and what personal protective equipment to use and where it is located.
- Abtrex will instruct employees being assigned to any non-routine tasks of the hazardous substances or conditions they may encounter, and will provide them information on the hazards of such materials and tell them what procedures to follow to protect themselves in performing such work.

2. Contingency Plan

a. Medical Emergency

1. Employee notifies the foreman.
2. Foreman decides whether to send employee to Hospital Emergency Room or call 911 for emergency service.

b. Chemical Spill and/or Fire Emergency

1. Employee sounds a Code (1) Alert (over the intercom system). This is designated as an evacuation notice. All employees are to leave the building and proceed directly to the designated meeting area.
2. Foreman will:

- a. Call Environmental Emergency # (if Chemical Spill)
- b. Call Fire Department if it is a fire.
- c. Account for all employees.

c. Information Contractors of Hazard

Abtrex Industries, Inc. will inform contractors of the hazardous substances their employees may encounter working in our facilities, so that the contractor can provide such persons information on any hazards in the workplace and the procedures to follow to protect themselves.

d. Listing of Hazardous Chemicals known to be present in the workplace (refer to the appropriate material safety data sheet for a full description of each item listed)

- (MEK) Methyl Ethyl Ketone
- Acetone
- Polyline
- (CPB) Dybutyl Xanthogen Disulfied
- Paints/Primers
- Isopropynol
- Heptain (small amounts)
- Tolulene
- Xylene
- Ethyl Benzene
- Epichlorohydrin
- Dimenthylaneiline
- Cobalt Naphthenate

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HEARING CONSERVATION PROGRAM

1.0 Purpose

1.1 The purpose of Abtrex's Hearing Conservation Program is to monitor our noise levels and prevent noise – induced employee hearing loss.

2.0 Definitions

8 Hour TWA of 85dBA - An eight-hour noise measurement that tells us that our employee has been exposed to an average of 85 decibels per hour for eight hours.

Also referred to as the action level.

Action Level - If/when any Abtrex employees are exposed at or above the 8-hour TWA of 85 decibels, then those employees must enter into a continuing, effective program.

Dose - Abtrex Industries will monitor workplace noise levels with an audio digital sound meter. By calculation, readings can be converted to an eight-hour time weighted average (TWA) sound level.

Employee Notification - Abtrex must notify any employees who have been exposed at or above the 8-hour TWA of 85dBA.

Audiometric Testing - For those employees who have been exposed to 8-hour TWA of 85dBA or more, audiometric hearing test will be provided initially and annually. Audiometric tests shall be performed by a licensed audiologist or physician. Baseline (initial) audiograms upon comparison to subsequent audiograms will identify any suspect employee hearing loss.

Annual Training Program – An annual training program will consist of the effects of noise on hearing, various topics on hearing protectors, and the purpose of audiometric testing. This training will be repeated annually for those employees included in the hearing program.

3.0 Policy

3.1 Required Equipment

3.1.1 Abtrex has purchased a Type 2 Digital Sound Meter #840029.

3.1.2. Good quality hearing protectors are provided at no cost to the employee. They protect our employees' hearing while working in our home shop locations, however, field work may require more effective hearing protection. If that is found to be the case, our customers will be responsible for any additional information.

3.2 The Safety Director will conduct surveys to determine if our employees are subjected to sound exceeding those listed in Table A. If it is determined that the listed sound levels and their durations are being exceeded, then hearing protection must be worn to reduce sound levels within the levels of the table.

TABLE A
PERMISSIBLE NOISE EXPOSURES

Duration per day, hours	Sound level dBA slow response
8	90
6	92
4	95
3	97
2	100
1.5	102
1.0	105
0.5	110
0.25 or less	115

3.2.1 A list of tasks with accompanying tools that exceed Table A noise levels will be assembled and communicated to our employees.

- 3.3 The Safety Director will survey to determine if any employee's exposure may equal or exceed an 8-hour TWA of 85dBA. For any employees at or above the action level, Abtrex will institute the following program for them.
- A. Employee is notified of their noise exposure.
 - B. Within six months, the employee will be given an audiogram which will serve as a baseline.
 - C. Each employee will receive an annual audiogram that can be compared to the baseline to determine if hearing loss has occurred.
 - D. Hearing protection must reduce exposure to at least an 8-hour TWA of 90dBA. If our employee has experienced hearing loss, that level drops to an 8-hour TWA of 85dBA.
 - E. Annual training includes the following topics: effects of noise on hearing, purpose of hearing protectors, instructions on selection, fitting, and use and purpose of audiometric testing.
- 3.4 While working at field jobs, our employees will follow our minimal standards set by this program. Abtrex employees will alternately conform to our customer's hearing program only if it exceeds ours and together we decide it is warranted.
- 3.5 The Safety Director is responsible for the accurate record of noise exposure measurements and all audiometric testing.
- 3.6 Abtrex will post a copy of the standard in the workplace.

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PERSONAL PROTECTIVE EQUIPMENT PROGRAM

1.0 Purpose

- 1.1 The purpose of personal protective clothing and equipment (PPE) is to protect our employees from the chemical and physical hazards in the workplace.
- 1.2 While some personal protective equipment is required for certain jobs at Abtrex, for instance face shields for welding, our first choice will always be to eliminate the hazard rather than using PPE. The use of PPE can itself create worker hazard, such as heat stress, impaired vision, reduced mobility, and difficult communication.

2.0 Available Equipment

2.1 The following list of equipment is available to our employees for their protection:

1. Respirators: Half mask, full face piece, and air supplied
2. Safety Glasses/Goggles/Full Face Shields: Grinding, drilling, chemical liquids
3. Ear Plugs: Noise protection
4. Rubber Gloves/Cloth Gloves/Welding Gloves: General protection
5. Cloth Work Uniforms: General protection
6. Tyvek Coveralls (Paper): General Protection

7. Hard Hats: Falling objects or overhead hazards
8. Face Shields: Grinding, acid, caustic, or chemical liquids
9. Cutting Goggles: Cutting with oxyacetylene torch
10. Full Harnesses and Lifelines with Shock Absorber: Fall protection

3.0 Policy

3.1 Due to the nature of our business, working in tanks and with explosive fumes, we do not recommend steel-toed shoes because of the possibility of steel-to-steel contact and the possibility of sparks that could ignite fumes. However, in the field we have found that some customers required steel-toed shoes/boots. If necessary, our employees are instructed to wear steel-toed shoes/boots.

3.2 Training for our employees will be provided by or through the Safety Director. Using the assessment as a base, training will be built around the following topics:

1. When PPE is necessary
2. What PPE is necessary
3. How to use PPE
4. Limitations
5. Proper care of PPE

3.3 After completion of training, each employee will receive written certification.

3.4 Our employees are encouraged to question dangerous situations, especially while in the field. In the event any Abtrex employee believes a hazardous condition exists, he may contact his direct supervisor and in turn, report to the facility manager who can document the hazard using the attached Hazard Assessment & PPE Selection Worksheet.

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POWER LOCKOUT PROCEDURE

The following are the General Industry Safety Division's minimum requirements for establishment of a Power Lockout Procedure.

- A written power lockout procedure shall be provided.
- All necessary employees shall be instructed on this procedure.
- Employees shall be instructed in and conform to the following procedures:
 - a) Alert the operator(s) that power is being disconnected.
 - b) Before starting repair, service, or setup work on an engine, motor or power driven equipment, person(s) performing work shall make sure that the power is disconnected (and any hazardous residual pressure shall be relieved) prior to and during such work. A padlock(s) shall be placed at the point of power disconnect where lockout is required by each person(s) performing work. Individual locks shall be used or an authorized employee of each crew shall be responsible for placing the lock and determining that each crew member is clear before removing the lock, or a supervisor may place a lock for which he has the only key and assure that all crews are clear before removing the lock. Keys shall be removed at the time of lockout. Before the work is started, equipment shall be tested to insure that the power is off.
 - c) No one other than person(s) placing padlock(s) on power lockout shall remove padlock(s) and restore power. (Exception: Supervisor may remove padlock(s) and restore power after a thorough check to make sure that no person will be exposed to danger).

- d) If it is necessary for work on a machine or installation to be continued by the next shift personnel, the padlock(s) of the original employees shall be removed by those employees in the presence of the oncoming shift who will immediately insert their own padlock(s) into the disconnect. All concerned personnel (operators, repairmen, and supervision) shall be thoroughly informed.
- e) A machine connected to an electrical source by a plug-in cord shall be considered in compliance if the plug is disconnected and tagged, provided that the plug is a legal disconnecting means. (Plugs are acceptable as disconnecting means only for portable motors and 110V fixed equipment).
- f) Any equipment component that needs blocking to prevent its movement by gravity or other means must be blocked. (Example: power press rams).

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RESPIRATOR PROGRAM

1.0 INTRODUCTION

- 1.1 Hazards to the lungs are not always easy to detect. Some of the most common hazards are the lack of oxygen and the presence of harmful dust, fogs, smokes, mists, fumes, gases, vapors, or sprays, including substances that may cause cancer, lung impairment, other diseases, or death. Respirators prevent the entry of harmful substances into the lungs during breathing. Some respirators also provide a separate supply of breathable air so work can be performed where there is inadequate oxygen, or where greater protection is needed.

The prevention of atmospheric contamination at the work site generally should be accomplished as far as feasible by engineering control measures, such as enclosing or confining the contaminant-producing operation, or exhausting the contaminant. Historically, the industrial hygiene profession has sought to control hazardous air contamination through engineering means. When effective engineering controls are not feasible, or while those controls are being installed, however, appropriate respirators must be used. The user should be aware that respirators have their limitations and are not a substitute for effective engineering controls. Abtrex Industries, Inc. is responsible for establishing an effective respiratory program. Different hazards require different respirators and Abtrex employees are equipped and responsible for complying with the program. At Abtrex Industries, Inc., the respirator program will be administered by the Safety Director, who reports directly to the Plant Manager. The respirator program is fully supported by upper management and responsibility for enforcement is by the Shop Foreman.

2.0 PURPOSE

- 2.1 The purpose of this respiratory protection program is to control occupational illness for Abtrex employees who are working in/near air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, vapors and air containing less than 19.5% oxygen or more than 23.5%. Although, the primary objective is to prevent such atmospheric contamination, employees must wear respirators when the atmosphere contains contaminants concentrated enough to threaten health.

3.0 RESPIRATOR SELECTION

- 3.1 Half-mask and full facepiece respirators provide greater protection than the dust mask although the dust mask is still acceptable for certain applications. These respirators provide protection against dusts, mists, fumes, vapors, gases or any combination of these contaminants depending on the type of filter being used. The full facepiece respirator provides the greatest degree of protection and protects the eyes as well. Many different filter elements are available. Vapor cartridges should be changed when odors “breakthrough” and are noticeable inside the mask. It is important to choose the right filter or combination of filters for a given job.
- 3.2 The following list presents a simplified version of characteristics and factors used for respirator selection.

HAZARD	RESPIRATOR	SELECTION DESCRIPTION
Gas and Vapor Contaminants		
Not immediately dangerous to life or health	1. None	Dissipated with ventilation No odor
	2. Dust Mask	Nuisance Levels
	3. Chemical Cartridge Respirator	Moderate Concentrations
Immediately dangerous to life or health	Supplied Air Respirator Fed by one of the following: 1. Air line 2. Air pump 3. Bottled air	Above 10% of LEL and O ₂ less than 19.5%. Mitigate with ventilation
Gaseous and Particulate Contaminants		
Not immediately dangerous to life or health	1. None	No odor/No particulates
	2. Dust mask	Nuisance levels
	3. Chemical cartridge	Moderate concentration

respirator

Immediately dangerous to life or health	Supplied air respirator fed by one of the following: 1. Air line – with proper air source 2. Air pump 3. Bottled air	Above 10% of LEL and O ₂ less than 19.5%. Mitigate with ventilation
---	---	---

Particulate Contaminants

1. None	No particulates
2. Dust Mask	Nuisance levels
3. Cartridge Respirator	Moderate concentrations

Oxygen Deficiency

Immediately dangerous to life or health	Supplied air respirator fed by one of the following: 1. Air line 2. Air pump 3. Bottled air	O ₂ less than 19.5% Mitigate with ventilation
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Oxygen Rich

Immediately dangerous to life or health	None	O ₂ is more than 23.5%. Abtrex is risking an explosion. Find O ₂ source and eliminate it before entering.
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3.3a Respirator Cartridge Selection

Gas and Vapor Contaminants

If organic vapor: MSA Black Cartridge GMA Part #464031.
If Acid Vapor: MSA GMC P100 Shortstack Part #815188.

Metallic Mercury, Vapor and

Mersorb P100 Shortstack

Chlorine, and dusts, mists & fumes associated with these materials.

Part #815193

Paints

MSA GMA Part #464031 with R-95 Pre-filter & strap on cover.

Gas and Particulate Contaminants

MSA GMA P100 shortstack
Part #815186

Particulate Contaminants

MSA Cartridge P100
Part #815175

3.3b Respirator cartridge change schedules

Abtrex employees wearing either 1/2 mask or full face air purifying respirators shall change the cartridges on their respirators when they first begin to experience difficulty breathing (i.e. resistance) while wearing their masks. Depending on environment (see above section 3.3a), each employee will be responsible to replace their cartridge with the correct part # cartridge.

Due to the nature of Abtrex's work (field or shop work), where our employees wear their respirators only periodically, we will not change cartridges based on a certain time interval.

3.3c Respirator Use

Respirator protection is required for the following personnel:

Department	Job Description	Respirator
Sandblasting	Operator	SAR, continuous flow hood
Painting Booth	Paint Sprayer	Half mask with GMA pt#464031 with R-95 pre-filter and strap-on cover
Tank Lining	Primer/Adhesive application	Half mask with GMA pt#464031
Fabrication	Welder	Dust Mask or half mask with P100 pt#815175

General Use Procedures:

- All employees shall conduct user seal checks each time that they wear their respirator. Employees shall use either the positive or negative pressure check (depending on which test works best for them).
- For similar information see 3.0 Respirator Selection.

3.3d Emergency Situations

The following work areas have been identified as having foreseeable emergencies:

Spray Booth – spill of MEK or paint thinner

Tank Liner Area – spill of Toluene based primers

If a spill occurs in either of the above areas, employees in the affected department must immediately don their half mask respirators, shut down any electrical equipment, and exit the work area. Since these chemicals are not IDLH, personnel should immediately advise the shop manager and clean up spill in an environmentally safe way.

Note: Emergency escape respirators are not necessary and therefore are not provided.

4.0 PROGRAM EVALUATION

- 4.1 The effectiveness of Abtrex's respirator program will be evaluated periodically and modified as needed by Safety Director.

5.0 TRAINING

- 5.1 Both supervisors and workers will be taught the proper selection, use, and maintenance of respirators. Training at Abtrex will include an explanation of the following:

- Nature of the respiratory hazard and what may happen if the respirator is not used properly.
- Engineering and administrative controls being used and the need for the respirator as added protection.
- Reason(s) for selection of a particular type of respirator.
- Limitations of the selected respirator.
- Methods of donning the respirator and checking its fit and operation.
- Proper wear of the respirator.
- Respirator maintenance and storage.

6.0 FIT TESTING

6.1 Inspection

6.1.1 Headbands: Check to see that the headbands still have their elasticity.

6.1.2 Facepiece: Check facepiece for dirt, cracks, tears or holes. Inspect the shape of the facepiece for possible distortion.

6.1.3 Inhalation and exhalation.

6.1.4 Valves: Check for cracks, tears, distortion, or dirt build-up.

6.1.5 Cartridge Holders: Check to make sure gaskets are in place and check for cracks and damage to threads.

6.1.6 Cartridges and/or filters: Make sure cartridges and filters are clean.

6.2 Test for fit

- 6.2.1 The fit test shall not be conducted if there is any hair growth between the skin and the face piece sealing surface, such as stubble beard growth, beard, mustache or sideburns which cross the respirator sealing surface.
- 6.2.2 Test respirator for leakage using a positive pressure method. Lightly place palm over exhalation valve cover. Gently exhale. A slight positive pressure should build up inside the respirator. If any leakage is detected around the facial seal, readjust head harness straps and repeat test until there is no leakage. If other facial seal leakage is detected, the condition must be investigated and corrected before another test is made. A negative pressure test may also be performed on certain types of respirators. Lightly place palms over cartridges of filter holders. Gently inhale and facepiece should collapse against face.

The respirator must pass the fit tests before the respirator is used. The respirator will not furnish protection unless all inhaled air is drawn through suitable cartridges or filters.

- 6.2.3 The effectiveness of the fit of the facepiece will be tested qualitatively and annually at Abtrex by the Shop Foreman. Upon successful completion of the employee's respirator fit, the fit test record will be generated and kept on file for one year. See Appendix A.
 - 6.2.3.1 The respirator to be tested shall be equipped with MSA GMA P100 Shortstack Part #815186 or P100 Part #815175.
 - 6.2.3.2 The test subject shall be allowed to smell a weak concentration of the irritant smoke before the respirator is donned to become familiar with its characteristic odor.
 - 6.2.3.3 Break both ends of a ventilation smoke tube containing stannic oxychloride, such as the MSA Part #5645 or equivalent. Attach one end of the smoke tube to a low flow air pump set to deliver 200 milliliters per minute.
 - 6.2.3.4 If a half mask is being fitted, advise the test subject that the smoke can be irritating to the eyes

and instruct the subject to keep his/her eyes closed while the test is being performed.

6.2.3.5 The test conductor shall direct the stream of irritant smoke from the smoke tube towards the face seal area of the test subject. He/she shall begin at least 12 inches from the facepiece and gradually move to within one inch, moving around the whole perimeter of the mask.

6.2.3.6 Each test subject passing the smoke test without evidence of a response shall be given a sensitivity check of the smoke from the same tube once the respirator has been removed to determine whether he/she reacts to the smoke. Failure to evoke a response shall void the test.

6.2.3.7 The fit test shall be performed in a location with exhaust ventilation sufficient to prevent general contamination of the testing area by the test agent.

6.3 Fit under special conditions

6.3.1 Facial Hair: Beards and other facial hair can reduce the effectiveness of a respirator by preventing a tight seal between the facepiece and the face of the wearer. A tight seal allows the respirator to function at its maximum efficiency and provides the wearer maximum protection. Therefore, any facial hair that comes between the sealing surface of the facepiece and the face or interferes with the valve function is not permitted.

6.3.2 Eyeglasses: Ordinary eyeglasses should not be used with facepiece respirators. Special prescription eyeglass adapter can be mounted inside a full facepiece respirator and are available from the respirator manufacturer. Contact your supervisor if you feel that you need an adapter.

6.3.3 Contact Lenses: Several factors may restrict or even prohibit the use of contact lenses while wearing any type of respirator. OSHA is considering a change in their respirator standard with regard to the use of contact lenses under respirators.

6.3.4 Facial Deformities: Facial deformities, such as scars, deep skin creases, prominent cheekbones, severe acne, and the

lack of teeth or dentures can prevent a respirator from sealing properly.

7.0 INSPECTION, CLEANING, MAINTENANCE AND STORAGE

- 7.1 Inspection: All respirators must be visually inspected by the wearer before and after each use. If repair is needed, experienced persons with parts designed for the respirator will mend the respirator and return it. Annually the experienced person will complete an inspection of our employees' full and half face respirators and complete an inspection record, Appendix B, for each. The Safety Director will oversee all inspections.
- 7.2 Cleaning, Maintenance and Storage: Respirators may be washed in a detergent solution and then disinfected by immersion in a sanitizing solution (MSA Part # 34337). Optionally the respirator can be cleaned with soap and water.

8.0 MEDICAL EXAMINATIONS

- 8.1 Persons assigned to tasks that require the use of a respirator must be physically able to perform the work while using the respirator. The respirator user's medical status will be reviewed annually by administering a medical questionnaire and if need be, a medical examination. Chest x-rays will be given every five years. Testing, x-rays, and examinations will be administered by a qualified medical facility.

9.0 WORK AREA SURVEILLANCE

- 9.1 Surveillance must be maintained of the conditions in the work area and of the degree of worker exposure or stress (combination of work rate, environmental conditions, and physiological burdens of wearing a respirator). Changes in operating procedures, temperature, air movement, humidity, and work practices may influence the concentration of a substance in the work area atmosphere. These factors necessitate periodic monitoring of the air contaminant concentration. Testing must continue to ensure that the contaminant exposure has not risen above the maximum protective capability of the respirators being used.

10.0 AIR QUALITY STANDARDS

Compressed air, compressed oxygen, liquid air and liquid oxygen used for respiration shall be of high purity. Oxygen shall meet the requirements of the United States Pharmacopoeia for medical or breathing oxygen. Breathing air shall meet at least the requirements of the specification for Grade D breathing air

as described in Compressed Gas Association commodity specification G-7.1-1966. A compressor used to supply breathing air shall be a breathing air-type compressor. Compressors shall be constructed and situated so as to avoid entry of contaminated air into the system and suitable in-line air-purifying sorbent beds and filters installed to further assure breathing air quality. Airline couplings must be incompatible with outlets for other gas systems to prevent accidental servicing of air-line respirators with nonrespirable gases or oxygen.

11.0 APPROVED RESPIRATORS

Respiratory protective devices must be approved jointly by the Mine Safety and Health Administration of the Department of Labor and the National Institute for Occupational Safety and Health.

Air-purifying respirators: MSA Comfo Classic and Comfo Elite half-face respirators, and Ultra Twin full face respirators.

Supplied Air Respirators:

1. Air Line Source – Regulated plant air system that uses appropriate air hose and fittings that are incompatible with non-breathing air hose.
2. Air Pump – Abtrex recommends using oil-less Bullard Free – air pumps. They are reliable and operate electrically. As a result, CO monitors and temperature alarms are not needed.
3. Bottled Air – Use pressure demand respirators if bottled air is used. If normal continuous-flow supplied air respirators are used, bottled air is quickly expended.

WARNING: When assembling supplied air systems, make sure all air hose and fittings are designed for respirator use and are incompatible with non-breathing components.

USER VERSION

RESPIRATOR PROGRAM

1.0 Annual Inspections

- 1.1 Experienced persons will inspect all employee respirators and the company's supplied air respirators, plus sign and complete Appendix B.
- 1.2 The effectiveness of respirator fit will be tested with irritant smoke (MSA Part #5645) or equivalent by the Shop Foreman and recorded in Appendix A.

- 1.3 Employee pulmonary performance test. Chest x-ray will be done every five years. Testing and x-rays will be administered by a qualified medical facility.

2.0 Continual Inspections

- 2.1 Our employees will visually inspect their respirator before and after each use.

** Note: Ultimately, your safety is dependent on your full cooperation.

ABTREX INDUSTRIES, INC.

Corrosion & Abrasion Resistant Fabrications, Linings & Coatings

28530 REYNOLDS INKSTER, MI 48141

PHONE: (734)728-0550

FAX: (734)728-6180

59640 MARKET STREET SOUTH BEND, IN 46614

PHONE: (574)234-7773

FAX: (574)288-6180

THIRD & FERRY STREETS LEETSDALE, PA 15056

PHONE: (724)266-5425

FAX: (724)728-6180

SCAFFOLDING PROGRAM

1.0 Purpose

1.1 To protect our employees' health and safety while engaged in work that cannot be done from the ground or from solid construction.

2.0 Definitions

Extension Ladder: An extension ladder is a non-self-supporting portable ladder adjustable in length. It consists of two or more sections traveling in guides or brackets so arranged as to permit length adjustment. Its size is designated by the sum of the lengths of the sections measured along the side rails.

Guardrail: A rail secured to uprights and erected along the exposed sides and ends of scaffolding platforms.

Large Area Scaffold: A tube and coupler scaffold, systems scaffold, or tubular welded frame scaffold erected over the entire work area.

Maximum Intended Load: The total of all loads, including the working load, the weight of the scaffold, and such other loads as may be reasonably anticipated.

Mid-Rail: A rail approximately midway between the guardrail and platform, used when required, and secured to the uprights erected along the exposed sides and ends of platforms.

Stepladder: A stepladder is a self-supporting portable ladder, nonadjustable in length, having flat steps and a hinged back. Its size is designated by the overall length of the ladder measured along the front edge of the side rails.

Systems Scaffold: A scaffold consisting of posts with fixed connection points that accept runners, bearers, and diagonals that can be interconnected at predetermined levels.

Toeboard: A vertical barrier at floor level erected along exposed edges of a floor opening, wall opening, platform, runway, or ramp to prevent falls of materials.

Tube and Coupler Scaffold: A scaffold consisting of a platform(s) supported by tubing, erected with coupling devices connecting uprights, braces, bearers, and runners.

Tubular Welded Frame Scaffold: A scaffold consisting of a platform(s) supported on fabricated end frames with integral posts, horizontal bearers, and intermediate members.

3.0 Scaffolds

3.1 Procedures

Abtrex requires that all scaffolds, used by our employees, conform to OSHA Subpart D 1910.28 Safety Requirements for Scaffolding.

3.11 Safety Requirements for Scaffolding

- Scaffolding shall be erected on a solid footing; rigid and capable of supporting without failure at least four times the maximum intended load.
- No scaffold shall be dismantled or altered without our job-site foreman's knowledge and permission. If the scaffolding for any reason, is deemed unsafe by our job-site foreman, he/she has the authority to stop work, until such a time that the scaffolding is reconstructed/modified to a safe condition.
- All scaffolding more than ten feet above the ground or floor, shall have guardrails consisting of a forty-two inch high top rail, (with minimum 200 pound capacity), a mid-rail, and toe-boards.
- Competent and experienced personnel shall erect and dismantle all scaffolds. When working on site at a customer's plant, our experienced employees may assemble and dismantle both stationary and rolling scaffolds. In some instances, we may choose to hire an experienced contractor to assemble and dismantle the scaffold. However, Abtrex requires that complex, large area scaffolding (as previously defined) be assembled and

dismantled by an experienced scaffolding contractor. Our sales engineer will address any questions on this matter during the pre-job lineup.

- Any frame scaffolds over 125 feet in height, as measured above the base plates, shall be designed by a registered professional engineer. Copies of drawings and specifications shall be made available to Abtrex and our customer for approval.
- The maximum work level height shall not exceed four (4) times the minimum or least base dimensions of any scaffold. Where the basic mobile unit does not meet this requirement, suitable outrigger frames shall be employed to achieve this least base dimension, or provisions shall be made to guy or brace the unit against tipping.
- The minimum platform width for any work level shall not be less than twenty (20) inches.
- A climbing ladder or stairway shall be provided for proper access and egress, and shall be affixed or built into the scaffold and so located that its use will not have a tendency to tip the scaffold. A landing platform shall be provided at intervals not to exceed thirty (30) feet.
- All scaffold casters shall be provided with a positive wheel and/or swivel lock to prevent movement.
- All planking shall be OSHA stamped scaffold grade as recognized by grading rules for the type of wood used.

3.12 Fall Protection

- All Abtrex employees working on a scaffold more than ten feet above a lower level shall be protected from falling to that lower level by a guardrail system, as previously defined. While working from scaffolds that do not have proper guardrails, our employees must use full body safety harnesses and shock absorbing lanyards. For details in determining our proper anchorage points to attach lanyards, please consult our Fall Protection Program.

4.0 Ladders

4.1 Safety Procedures for Ladders

- Ladders shall be visually inspected before each use and those which have developed defects shall be withdrawn from service for repair or destruction and tagged or marked as “Dangerous – Do Not Use”.
- Abtrex Industries recommends using fiberglass step, and fiberglass or aluminum extension ladders whenever possible. Both are durable and non-sparking.

4.2 Use

- Ladders shall not be placed in front of doors that open towards the ladder unless the door is blocked, locked, or guarded.
- No ladder should be used to gain access to a roof, unless the top of the ladder extends at least three feet above the point of support, at eave, gutter or roofline.
- Ladders should not be used as a brace, skid, guy, or gangway, or for other uses than that for which they were intended, unless specifically recommended by the manufacturer.
- Single and extension ladders must be adjusted to the proper slope. The foot of the ladder should be a distance of 25% of the height of the ladder away from the object the ladder is placed against.
- Stay off the top two rungs of a straight or extension ladder or the top step and cap of a stepladder.

5.0 Training

5.1 Training will include information about the following topics:

- The nature of fall hazards and falling object hazards in the work area
- Proper use of the scaffold
- Maximum intended load and the load-carrying capacities
- Scaffold Specifics
- Setting up ladders

- Climbing ladders
- Working safety from ladders

ABTREX INDUSTRIES, INC.

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SUBSTANCE ABUSE PROGRAM

Abtrex Industries, Inc. is committed to a drug-free workplace. A qualification for employment is to pass a pre-employment drug test. Abtrex Industries, Inc. will not hire any job applicant with a "positive" pre-employment drug test. Abtrex Industries, Inc. will also not hire any job applicant who refuses to take the pre-employment drug test or to sign the consent form for the drug test.

A "positive" drug test does not mean that the employee was impaired by or under the influence of drugs at the time that the specimen (urine, blood, hair, etc.) was collected/taken. A "positive" result only indicates that the employee consumed the detected drug in the relatively recent past.

Abtrex Industries, Inc. will require an employee reasonably suspected of being impaired by or under the influence of alcohol and/or drugs to be tested for alcohol and/or drugs at Abtrex Industries, Inc.'s expense by qualified medical personnel.

All Abtrex employees involved in industrial accidents, which require physician evaluation and/or treatment, will be required to be drug and alcohol tested if the company suspects any drug and/or alcohol use prior to or during the accident.

Abtrex Industries, Inc., is seriously concerned about employee drug and alcohol abuse. Starting September 23, 1998, the company will support a random testing program that will test our employees for drug and alcohol abuse. Abtrex reserves the right to determine the level of random testing.

A refusal to take an alcohol or drug test is insubordination and could result in immediate discharge.

Abtrex Industries, Inc. defines "impaired by" or "under the influence of" alcohol as a breath or blood alcohol concentration of 0.02% or above.

Reporting for work or working while impaired by or under the influence of alcohol could result in immediate discharge.

A "positive" drug test, by itself, will not result in disciplinary action. Abtrex Industries, Inc. will determine on the basis of all the available evidence, including the "positive" drug test, if an employee has violated the work rule prohibiting an employee from reporting for work or working while impaired by or under the influence of drugs.

Violation of the following work rules is grounds for immediate discharge:

1. Possession or drinking of any alcoholic beverages on Abtrex Industries, Inc. property, Abtrex Industries, Inc. customer's property or Abtrex Industries, Inc.'s company vehicles, at any time, including during breaks or lunch. Reporting for work while impaired by or under the influence of alcohol (0.02% breath or blood alcohol concentration or above).
2. Possession, use, distribution, sale or offering for sale of narcotics or any controlled or illegal substance, including marijuana, on Abtrex Industries, Inc. property, Abtrex Industries, Inc. customer's property or Abtrex Industries, Inc. company vehicles, at any time, including breaks or lunch. Reporting for work or working while impaired by or under the influence of narcotics or any controlled or illegal substance, including marijuana, except a drug prescribed for the employee by a physician. An employee whose ability to work is impaired by a drug prescribed for the employee by a physician and used by the employee as prescribed will not be permitted to remain at work, but will not be disciplined.

EMPLOYEE ASSISTANCE

If Abtrex deems it necessary, employees who have been identified as having an alcohol/drug problem will be asked to enroll in a substance abuse program. Each employee situation will be handled confidentially and depending on circumstances may include other disciplinary actions.

Intensive rehabilitation classes generally last four weeks with follow-up classes one evening a week for twelve weeks. Upon completion of the program, a physician will sign a release which will become part of the employee's record. Total rehabilitation is expected.

The above mentioned program is covered under our medical plan. The medical plan pays 50% of covered charges after the deductible is met. The employee is responsible for the remaining 50%.

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HYDROFLUORIC ACID PROGRAM

1.0 Purpose

- 1.1 The purpose of this safety program is to protect our employees from injury while working in or near tanks that have contained Hydrofluoric Acid. Hydrofluoric Acid is extremely dangerous. It can severely damage skin, eyes, and the respiratory system.

2.0 Definitions

- 2.1 Hydrofluoric Acid (HF) is very corrosive and poisonous. A violent exothermic reaction occurs with water. It reacts with most metals to produce hydrogen gas, which can form an explosive mixture with air.
- 2.2 HF Acid not only causes surface burns but rapidly penetrates the skin, even in dilute solution, and causes destruction of underlying tissue and even bone by the extraction of calcium.
- 2.3 HF Antidote Gel
This neutralizing agent (Calcium Gluconate) will be purchased by Abtrex and made available to our employees who might be exposed to HF. It is important for our employees to have immediate access to an effective antidote because the onset of pain, particularly in dilute solutions, may not be felt for up to 24 hours.

3.0 Policy

- 3.1 Abtrex Industries will not work in or near tanks that have contained or do contain HF Acid at concentrations of 51% or above. We will work in tanks

that have stored from very dilute to and including 50% HF Acid, with the understanding that the tank has been emptied and purged.

3.2 All Abtrex employees working with any concentration of Hydrofluoric Acid will be informed before working about the dangers of HF.

3.2.1 Eye Contact: Provide 0.5% Pontocaine Hydrochloride Solution. Available by prescription only.

3.2.2 Skin Contact: HF Antidote Gel, available from Mar-Main Pharmacy, (They compound this antidote gel).

439-426 N. Michigan, South Bend, Indiana
Phone #: (574) 234-3184 or (574) 246-6800

3.3 Personal Protective Equipment

If PPE is required, it should be charged to the customer as a cost of doing business.

3.3.1 Respiratory Protection
Supplied air with full-face respirator

3.3.2 Full Protective Clothing: Acid-resistant jacket and trousers in Tychem 9400. Available from Lakeland Industries, Inc.

Phone: (800) 645-9291
Fax: (205) 350-0773

3.3.3 PVC Boots, style 9255
Available from Ironwear

Phone: (800) 329-2235

3.3.4 Nitrile soft lined gloves, Model #37-175. Sol-Vex
Available from Pro-Tec

Part # 04-457509-Size 9
Phone: (219) 522-7233
Fax: (219) 295-6551

MSDS Number: **H3994** * * * * * *Effective Date: 08/18/05* * * * * * *Supercedes: 07/07/04*

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865



24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

HYDROFLUORIC ACID

1. Product Identification

Synonyms: Fluorohydric acid; fluoric acid; Hydrogen fluoride solution

CAS No.: 7664-39-3

Molecular Weight: 20.01

Chemical Formula: HF in Aqueous Solution.

Product Codes:

J.T. Baker: 5368, 5659, 5818, 5823, 5824, 5840, 5865, 6904, 9559, 9560, 9563, 9564, 9567, 9572, 9573, 9574, 9575

Mallinckrodt: 2640, 2648, V141, V580

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent
Hazardous		
-----	-----	-----

Hydrogen Fluoride	7664-39-3	48 - 52%
Yes		
Water	7732-18-5	48 - 52%
No		

3. Hazards Identification

Emergency Overview

POISON! DANGER! CORROSIVE. EXTREMELY HAZARDOUS LIQUID AND

VAPOR. CAUSES SEVERE BURNS WHICH MAY NOT BE IMMEDIATELY PAINFUL OR VISIBLE. MAY BE FATAL IF SWALLOWED OR INHALED. LIQUID AND VAPOR CAN BURN SKIN, EYES AND RESPIRATORY TRACT. CAUSES BONE DAMAGE. REACTION WITH CERTAIN METALS GENERATES FLAMMABLE AND POTENTIALLY EXPLOSIVE HYDROGEN GAS.

SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 4 - Extreme (Poison)

Flammability Rating: 0 - None

Reactivity Rating: 2 - Moderate

Contact Rating: 4 - Extreme (Corrosive)

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD;
PROPER GLOVES

Storage Color Code: White (Corrosive)

Potential Health Effects

Exposure to hydrofluoric acid can produce harmful health effects that may not be immediately apparent.

Inhalation:

Severely corrosive to the respiratory tract. May cause sore throat, coughing, labored breathing and lung congestion/inflammation.

Ingestion:

Corrosive. May cause sore throat, abdominal pain, diarrhea, vomiting, severe burns of the digestive tract, and kidney dysfunction.

Skin Contact:

Corrosive to the skin. Skin contact causes serious skin burns which may not be immediately apparent or painful. Symptoms may be delayed 8 hours or longer. The fluoride ion readily penetrates the skin causing destruction of deep tissue layers and even bone.

Eye Contact:

Corrosive to the eyes. Symptoms of redness, pain, blurred vision, and permanent eye damage may occur.

Chronic Exposure:

Intake of more than 6 mg of fluorine per day may result in fluorosis, bone and joint damage. Hypocalcemia and hypomagnesemia can occur from absorption of fluoride ion into blood stream.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders, eye problems, or impaired kidney or respiratory function may be more susceptible to the effects of this substance.

4. First Aid Measures

For any route of contact: Detailed First Aid procedure should be planned before beginning work with HF.

Inhalation:

Get medical help immediately. If patient is unconscious, give artificial respiration or use inhalator. Keep patient warm and resting, and send to hospital after first aid is complete.

Ingestion:

If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Contact:

1) Remove the victim from the contaminated area and immediately place him under a safety shower or wash him with a water hose, whichever is available. 2) Remove all contaminated clothing. Handle all HF-contaminated material with gloves made of appropriate material, such as PVC or neoprene. 3) Keep washing with large amounts of water for a minimum of 15 minutes. 4) Have someone make arrangements for medical attention while you continue flushing the affected area with water. 5) If the following materials are available, limit the washing to five minutes and immerse the burned area in a solution of 0.2% iced aqueous Hyamine 1622 or 0.13% iced aqueous Zephiran Chloride. If immersion is not practical, towels should be soaked with one of the above solutions and used as compresses for the burn area. Ideally compresses should be changed every 2 minutes. Alternately, 2.5% calcium gluconate gel should be massaged into the affected area. 6) Seek medical attention as soon as possible for all burns regardless of how minor they may appear initially. Hyamine 1622 is a trade name for tetracaine benzethonium chloride, Merck Index Monograph 1078, a quaternary ammonium compound sold by Rohm & Haas, Philadelphia. Zephiran Chloride is a trade name for benzalkonium chloride, Merck Index Monograph 1059, also a quaternary ammonium compound, sold by Sanofi-Synthelabo Inc., New York, NY.

Eye Contact:

1) Irrigate eyes for at least 30 minutes with copious quantities of water, keeping the eyelids apart and away from eyeballs during irrigation. 2) Get competent medical attention immediately, preferably an eye specialist. 3) If a physician is not immediately available, apply one or two drops of ophthalmic anesthetic, (e.g., 0.5% Pontocaine Hydrochloride solution). 4) Do not use oily drops, ointment or HF skin burn treatments. Place ice pack on eyes until reaching emergency room.

Note to Physician:

General: For burns of moderate areas, (greater than 8 square inches), ingestion and significant inhalation exposure, severe systemic effects may occur, and admission to a critical care unit should be considered. Monitor and correct for hypocalcemia, cardiac arrhythmias, hypomagnesemia and hyperkalemia. In some cases renal dialysis may be indicated.

Inhalation: Treat as chemical pneumonia. Monitor for hypocalcemia, 2.5% calcium gluconate in normal saline by nebulizer or by IPPB with 100% oxygen may decrease pulmonary damage. Bronchodilators may also be administered.

Skin: For deep skin burns or contact with concentrated HF (over 50%) solution, consider

infiltration about the affected area with 5% calcium gluconate [equal parts of 10% calcium gluconate and sterile saline for injection]. Burns beneath the nail may require splitting the nail and application of calcium gluconate to the exposed nail bed. For certain burns, especially of the digits, use of intra-arterial calcium gluconate may be indicated.

Eyes: Irrigation may be facilitated by use of Morgan lens or similar ocular irrigator, using 1% aqueous calcium gluconate solution [50ml of calcium gluconate 10% in 500 ml normal saline].

AN ALTERNATIVE FIRST AID PROCEDURE: The effect of HF, i.e. onset of pain, particularly in dilute solutions, may not be felt for up to 24 hours. It is important, therefore, that persons using HF have immediate access to an effective antidote even when they are away from their work place in order that first aid treatment can be commenced immediately.

We recommend that any person in contact with HF should carry, or have access to a tube of HF Antidote Gel at all times; ideally with one tube at the work place, one on the person and one at home.

It is imperative that any person who has been contaminated by HF should seek medical advice when the treatment by HF Antidote Gel has been applied.

REFERENCES: 1. Brown, T.D. Treatment of Hydrofluoric Acid Burns 2. Sprout, W.L. et al Treatment of Severe Hydrofluoric Acid Exposures (Journal of American Occupational Medicine 25:12, 1993) 3. Bracken, W.M. et al Comparative Effectiveness of Topical Treatments for Hydrofluoric Acid Burns, University of Kansas (Journal of Occupational Medicine 27:10:1985) 4. Burke, W.J. , et al Systemic Fluoride Poisoning Resulting from A Fluoride Skin Burn (Journal of Occupational Medicine (5,39:1973)

HF ANTIDOTE GEL:

Distributed by Pharmascience Inc.

8400 Darnley Rd. Montreal, Canada. H4T 1M4

Phone: (514) 340 - 1114

Fax: (514) 342 - 7764

U.S. (Buffalo, NY) distributor: 1-800-207-4477

5. Fire Fighting Measures

Fire:

Not considered to be a fire hazard. Fire may produce poisonous or irritating gases.

Explosion:

Violent exothermic reaction occurs with water. Sufficient heat may be produced to ignite combustible materials. Reacts with metals forming flammable Hydrogen gas.

Fire Extinguishing Media:

Keep upwind of fire. Use water or carbon dioxide on fires in which Hydrofluoric Acid is involved. Halon or foam may also be used. In case of fire, the sealed containers can be kept cool by spraying with water.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive

pressure mode. Avoid getting water in tanks or drums; water can cause generation of heat and spattering. In contact with air, the acid gives off corrosive fumes which are heavier than air.

6. Accidental Release Measures

Notify safety personnel, provide adequate ventilation, and remove ignition sources since hydrogen may be generated by reactions with metals. Wear appropriate personal protective equipment as specified in Section 8. Do not flush to sewers or waterways. Spills: Evacuate the danger area. Apply magnesium sulfate (dry) to the spill area. Follow up with inert absorbent and add soda ash or magnesium oxide and slaked lime. Collect in appropriate plastic containers and save for disposal. Wash spill site with soda ash solution. NOTE: Porous materials (concrete, wood, plastic, etc.) will absorb HF and become a hazard for an indefinite time. Such spills should be cleaned and neutralized immediately. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker TEAM® 'Low Na+' acid neutralizer is recommended for spills of this product.

7. Handling and Storage

Keep in tightly closed polyethylene containers. Store in a cool, dry place with adequate ventilation separated from other chemicals. Protect from physical damage. Storage facilities should be constructed for containment and neutralization of spills. Handling and storage of HF requires special materials and technology for containers, pipes, valves, etc., which is available from suppliers. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

Hydrogen fluoride:

-OSHA Permissible Exposure Limit (PEL):

3 ppm (TWA)

ACGIH Threshold Limit Value (TLV):

3 ppm Ceiling as F

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded, a full facepiece respirator with an acid gas cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest.

For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. **WARNING:** Air purifying respirators do not protect workers in oxygen-deficient atmospheres. Since the IDLH is low (30 ppm), the above cartridge system is not specifically approved for HF. (3M Respirator Selection Guide)

Skin Protection:

Wear protective clothing, including boots or safety shoes with polyvinyl chloride (PVC) or neoprene. Use chemical goggles and/or a full face shield. Wear coveralls with long sleeves, gauntlets and gloves of PVC or neoprene. A high degree of protection is obtained with an air-inflated suit with mask and safety belt. Use protection suitable for conditions.

Eye Protection:

Use chemical safety goggles and/or full face shield where splashing is possible. Maintain eye wash fountain and quick drench facilities in work area.

9. Physical and Chemical Properties

Appearance:

Colorless, fuming liquid.

Odor:

Acrid odor. Do not breathe fumes.

Solubility:

Infinitely soluble.

Specific Gravity:

1.15 -1.18

pH:

1.0 (0.1M solution)

% Volatiles by volume @ 21C (70F):

100 (as water and acid)

Boiling Point:

108C (226F)

Melting Point:

< -36C (< -33F)

Vapor Density (Air=1):

1.97

Vapor Pressure (mm Hg):

25 @ 20C (68F)

Evaporation Rate (BuAc=1):

No information found.

10. Stability and Reactivity

Stability:

Stable at room temperature (68F) when stored and used under proper conditions.

Hazardous Decomposition Products:

On contact with metals, liberates hydrogen gas. On heating to decomposition, could yield toxic fumes of fluorides. Attacks glass and other silicon containing compounds. Reacts with silica to produce silicon tetrafluoride, a hazardous colorless gas.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Hydrofluoric acid is incompatible with arsenic trioxide, phosphorus pentoxide, ammonia, calcium oxide, sodium hydroxide, sulfuric acid, vinyl acetate, ethylenediamine, acetic anhydride, alkalis, organic materials, most common metals, rubber, leather, water, strong bases, carbonates, sulfides, cyanides, oxides of silicon, especially glass, concrete, silica, fluorine. Will also react with steam or water to produce toxic fumes.

Conditions to Avoid:

Moisture and incompatibles.

11. Toxicological Information

Hydrofluoric acid: Inhalation rat LC50: 1276 ppm/1H; Investigated as a mutagen, reproductive effector.

-----\Cancer Lists\-----

Ingredient Category	---NTP Carcinogen---		IARC
	Known	Anticipated	
Hydrogen Fluoride (7664-39-3) None	No	No	
Water (7732-18-5) None	No	No	

12. Ecological Information**Environmental Fate:**

If the pH is > 6.5, soil can bind fluorides tightly. High calcium content will immobilize fluorides, which can be damaging to plants when present in acid soils.

Environmental Toxicity:

This material is expected to be slightly toxic to aquatic life. 60 ppm*/Fish/Lethal/Fresh Water *=time period not specified. > 300ppm/48hr./Shrimp/LC50/Aerated Saltwater

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information**Domestic (Land, D.O.T.)**

Proper Shipping Name: RQ, HYDROFLUORIC ACID (WITH NOT MORE THAN 60% STRENGTH)

Hazard Class: 8, 6.1

UN/NA: UN1790

Packing Group: II

Information reported for product/size: 500LB

International (Water, I.M.O.)

Proper Shipping Name: HYDROFLUORIC ACID (WITH NOT MORE THAN 60% STRENGTH)

Hazard Class: 8, 6.1

UN/NA: UN1790

Packing Group: II

Information reported for product/size: 500LB

15. Regulatory Information

-----\Chemical Inventory Status - Part 1\-----

Ingredient	TSCA	EC	Japan
Australia			
Hydrogen Fluoride (7664-39-3)	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes

-----\Chemical Inventory Status - Part 2\-----

Ingredient	Korea	DSL	NDSL
Phil.			
Hydrogen Fluoride (7664-39-3)	Yes	Yes	No
Water (7732-18-5)	Yes	Yes	No

-----\Federal, State & International Regulations - Part 1\-----

Ingredient	RQ	TPQ	List
Hydrogen Fluoride (7664-39-3)	100	100	Yes
Water (7732-18-5)	No	No	No

-----\Federal, State & International Regulations - Part 2\-----

Ingredient	CERCLA	261.33	8 (d)

Hydrogen Fluoride (7664-39-3)	100	U134	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: Yes TSCA 12(b): No CDTA: No
 SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
 Reactivity: Yes (Mixture / Liquid)

Australian Hazchem Code: 2R

Poison Schedule: S7

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: **4** Flammability: **0** Reactivity: **1**

Label Hazard Warning:

POISON! DANGER! CORROSIVE. EXTREMELY HAZARDOUS LIQUID AND VAPOR. CAUSES SEVERE BURNS WHICH MAY NOT BE IMMEDIATELY PAINFUL OR VISIBLE. MAY BE FATAL IF SWALLOWED OR INHALED. LIQUID AND VAPOR CAN BURN SKIN, EYES AND RESPIRATORY TRACT. CAUSES BONE DAMAGE. REACTION WITH CERTAIN METALS GENERATES FLAMMABLE AND POTENTIALLY EXPLOSIVE HYDROGEN GAS.

Label Precautions:

- Do not get in eyes, on skin, or on clothing.
- Do not breathe vapor.
- Cool before opening.
- Use only with adequate ventilation.
- Wash thoroughly after handling.
- Store in a tightly closed container.

Label First Aid:

IN ALL CASES, CALL PHYSICIAN IMMEDIATELY. First Aid procedures should be pre-planned for HF emergencies. A supply of 50:50 water/magnesium sulfate paste or 2 1/2% Calcium Gluconate paste should be available where first aid medications are administered. If ingested, DO NOT INDUCE VOMITING. If patient is conscious, give large quantities of milk or water and send to hospital. If inhaled and patient is unconscious, give artificial respiration or use inhalator and send to hospital. In case of eye contact, wash open eyes with large but gentle stream of water for 15 minutes. Place ice pack on eyes until reaching emergency room. In case of skin contact, remove contaminated clothing and wash burn area with plenty of water to remove acid. Cover burn area with a poultice of 50:50 water/magnesium sulfate paste or 2 1/2% calcium gluconate paste. Leave in place until medical help arrives or patient is transferred to hospital.

Product Use:

Laboratory Reagent.

Revision Information:

MSDS Section(s) changed since last revision of document include: 3.

Disclaimer:

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WASTE DISPOSAL PROGRAM

1.0 General Background

Due to the nature of chemicals that come in contact with linings, determination on whether the lining material is hazardous by characteristic must be made prior to disposing of it. This is most easily accomplished by performing an analytical on the material. This, however, can be quite costly. Once determination is made, disposal options can be evaluated. Individual states and landfills decide what can go into the landfills and typically have their own criteria or methods for determining acceptance of even non-hazardous solid wastes into the landfills. For the most part, linings that were in contact with inorganic mineral acids and common corrosives that are being removed due to normal age degradation, can be disposed of in a relatively simple manner (via landfilling, duels blending, and recycling into useful aggregate). Since landfills have become so restrictive, the other methods of disposal mentioned are simpler, yet much more costly.

Linings that are degraded and damaged by incompatible materials (solvents, phenols, benzene, organics, and certain listed hazardous wastes) that are contained in the acids or corrosives being stored, used, or hauled must be handled with more caution, especially if there is permeation attack. Most hazardous landfills and material recyclers treat materials such as these on an individual basis due to the fact that there is no established consistency amongst them. Linings that were in certain known corrosive commodities can either: be shipped back to the customer for their disposal, or depending upon the commodity and quantity of material, landfilled or recycled.

Abtrex Industries, therefore, has established criteria for disposal of old linings:

- a) Linings that were in certain known corrosive commodities

- 1) Our preferred method is to ship the material back to the customer since they are the legal generator and are ultimately responsible for disposal.
 - 2) If the customer chooses to have us take care of disposal, we will handle it in a manner that complies with applicable state and federal EPA laws, rules, and regulations governing such materials, to the best of our knowledge. You will be charged for this service on a cost-plus basis. The method of disposal we would utilize is to have the material recycled, whether it be in a process that generates a useful aggregate or one that is ultimately used for fuels blending. This way, all traces of the materials are gone. If this method of disposal is utilized, we will issue you a certificate of materials recycling or certificate of disposal from the TSD facility the material was shipped to.
- b) Linings that were subjected to known incompatible media.
- 1) Linings that are subjected to known incompatible media (when this media is the major constituent of the product) can, in most cases, be shipped to the TSD site on an approval we presently have as an assumed hazardous waste (i.e.; analytical can be waived). Since most incompatible media of this nature are not the major constituent of what is in contact with the lining (it is typically contained in the acid or corrosive as a small percentage of the product), a simple pH test can be done to determine if the lining is hazardous by corrosivity. Certain products which come in contact with the linings, even as a minor constituent of the major product, such as cyanides, TCLP metals, semi-volatile organics, volatile organics, pesticides, etc. would mandate the linings be analyzed prior to shipping off of our site for disposal.

In either case, it is critical that we know what has come in contact with the linings. This allows us to provide our people the proper safety equipment needed to work on the linings and also assures that the material will be handled and ultimately disposed of in a manner that meets all local, state and federal laws/rules governing such material. Remember, you the customers, are the ones responsible for making sure the material is disposed of properly. Our role is only to assist you in accomplishing this. Whatever the case may be, the customer is responsible for any analytical and disposal costs incurred. It is also imperative, in all cases, that the lined equipment be thoroughly drained, given multiple rinses, and neutralized (if necessary) prior to us working on it.

We feel the criteria we have established are cost effective and address all pertinent legal issues. We welcome any input or suggestions you have to offer.

Each and every job will be handled in accordance with the aforementioned procedures. If you wish to vary or change from these procedures, advise us in writing. Remember, do not lose sight of the bottom line; the waste is your responsibility, but we dedicate ourselves to doing this job for you to the best of our abilities.

2.0 Policy

Old paints and coatings that contain lead and/or TCLP metals are a source of contamination for abrasive media used in the removal process (blasting sand, grit, grinding dust generated from abrasive wheels/stones, etc.). When these media come in contact with, and are mixed with these materials (old paints and coatings, etc.), the abrasives potentially become a hazardous waste. When this is the case, the media must be totally contained during the removal process and ultimately analyzed and disposed of properly. This is also the case when old, used unlined/uncoated/unpainted steel tanks and equipment (that have been exposed to certain chemical products and waste streams) have to be abrasive cleaned prior to receiving a coating, lining, or paint.

Abtrex Industries is committed to making a good faith effort to comply with state and federal environmental laws to the best of our ability. Our customers also have a responsibility to choose vendors and supply information to their vendors that will allow them to operate within the required boundaries. Remember, do not lose sight of the bottom line; how we handle the waste products that are generated off of your equipment during our process is your responsibility.

Some suggestions on how to insure compliance with the items mentioned in the first paragraph are as follows:

1. To determine if lead or metals exist in the paint or coating that will be removed, check with the technical data sheet on the material or call the manufacturer. A simple, inexpensive test using lead check swabs can be used to determine if lead exists.
2. To determine if the coating, paint or unlined steel (that was subjected to chemical products) will contaminate the abrasive media in excess of the allowable limits, abrade several small samples and have them analyzed.
3. Have the equipment abrasive cleaned at your plant prior to shipping to us.

Remember, in the case of uncoated steel and coatings that were exposed to chemical products, rinsing, steam cleaning, washing, neutralizing, and/or passivating may only clean contamination from the top surface and leave the surfaces underneath contaminated (which subsequently could be surfaces our abrasives penetrate).

3.0 Shop Notes on Used or Old Equipment

1. Tank exteriors – blasting or grinding off old paint.
2. Tank interiors – blasting or grinding off old coatings.
3. Tank interiors – blasting or grinding used, unlined tanks.

All three scenarios above have issues that must be addressed.

1. Old paints on the outside of tanks could contain lead or metals that would contaminate our blasting sand and abrasives.
2. Old coatings on the inside of a tank could contain lead or metals and could also contain residuals of the product that came in contact with it.
3. Old, unlined tanks could contain residuals from product that was in the tank.

In all three cases, our blast media and grinding dust could become contaminated to the degree that requires it to be analyzed and subsequently unsuitable to the degree that it would need to be contained and disposed of in a special manner.

1. We must always find out from the customer what paint or coating has to be removed and what chemicals came in contact with the steel or coating.
2. We cannot remove lead or TCLP metal based paint and coatings.
3. We cannot grind or blast steel or coatings that were in contact with TCLP metal laden chemicals or listed hazardous wastes.

We cannot be guaranteed, even if the tank, etc., was rinsed, neutralized, passivated, etc., that residual does not still exist which could ultimately contaminate our abrasive media (sand, grinding dust) which creates a contaminated and a disposal problem.

Options:

1. Have equipment cleaned and blasted prior to shipping to our facility.
2. Have a representative sample taken prior to shipping, have it analyzed, and provide us with the results. A simple inexpensive test can be performed when checking for lead (lead check swabs).
3. We will perform a sample and have it analyzed before we proceed.

4.0 Waste Procedures

1. Dried up adhesive out of buckets (must contain no free liquid).
2. Grinding dust and trimmings – new rubber.
3. Scrap rubber – new (Abtrex re-run, Goodrich, etc.).
4. Pennsylvania Power rubber and any specified.
5. FRP grinding dusts, trimmings, and cured resin – new.

1 through 5 goes into the 2 yard dumpster outside which is for our “S” and “U” wastes. This dumpster will be taken once a month. We must keep track of approximate weights for each (“U” = PA Power, etc., “S” = all others).

NOTE: Rubber boxes or tri-wall boxes can be used for amounts in excess of the 2 yard box and also for convenience prior to putting in 2 yard box.

1. Grinding dust – old rubber and FRP (i.e.; from patching and relining trailers, etc.).
2. Material stripped from equipment – from patching.
3. Blasting sand used on small repairs (most typically FRP).

If small quantities, put in a tri-wall box labeled “miscellaneous scrap”. If large amounts, put in a box and ship back to customer.