## Compressed Air

1. **Purpose**

The purpose of this program is to establish safe operating procedures for the protection of employees working with or on compressed air equipment.

1. **Responsibility**

Management shall:

* Provide the resources, guidance, equipment, communication, and enforcement necessary to ensure compliance with this policy.

Supervisors shall:

* Ensure that only those employees who have been trained and qualified to work with compressed air equipment are allowed to operate such equipment.
* Ensure that equipment needed is available and is in good working condition.
* Ensure damaged equipment is removed from service until repaired and tested.
* Provide employees with Personal Protective Equipment (PPE) necessary for their job.

Employees shall:

* Inspect compressed air equipment, hoses, and connections prior to use and note any damage or defects.
* Immediately report any damages or defects to their supervisors.
* Empty manual drains and taps on a regularly scheduled basis.

Safety Manager shall:

* Ensure effective implementation and maintenance of this program.
* Provide assistance on any matter concerning this program.
* Ensure that all newly purchased compressed air equipment complies with current safety regulations.

1. **General Safety Requirements**

* Compressed air shall not be used for cleaning purposes except where the pressure is reduced to less than 30 psi. and effective chip guarding and personal protective equipment is implemented.
* Appropriate personal protective equipment consistent with hazard shall be worn. Hearing and eye protection shall be worn when operating compressor air equipment. Goggles face shields or other eye protection must be worn by personnel using compressed air for cleaning equipment.
* A visual inspection shall be conducted to ensure compressed air cylinders in the workplace are in safe condition.
* Operators shall perform a pre-operational check of all air hoses, couplings and connections to determine if leakage or other damage exists. Do not operate unsafe equipment. Lockout/tagout damaged equipment.
* Choose safest location to place the compressor unit or compressor vehicle within the work area.
* Use wheel chocks to prevent portable air compressors from rolling away.
* Decompress air from compressor prior to removing any caps or air equipment attachments such as jack hammers, drills, etc.
* Keep oils and flammable materials clear of air fittings and joints.
* Operators shall be aware of employees and others on foot in work zones.
* Before a pneumatic tool is disconnected (unless it has quick disconnect plugs), the air supply must be turned off at the control valve and the tool bled.
* Static electricity can be generated through the use of pneumatic tools. This type of equipment must be grounded or bonded if it is used where fuel, flammable vapors or explosive atmospheres are present.

1. **Air Compressor Storage Tanks (Air Receivers)**

* Every air receiver shall be equipped with an indicating pressure gauge that is readily visible, and with one or more spring-loaded safety valves. The total relieving capacity of such safety valves shall prevent pressure in the receiver from exceeding the maximum allowable working pressure of the receiver by more than 10 percent.
* Only qualified personnel shall be permitted to repair air tanks. No tank or receiver shall be altered or modified by unauthorized persons.
* Air receivers shall be fitted with a drain cock that is located at the bottom of the receiver.
* Receivers shall be completely drained frequently to prevent accumulation of liquid inside the unit. Receivers having automatic drain systems are exempt from this requirement.
* Air tank shall be located so that its entire outside surface can be easily inspected.
* Each air receiver shall be equipped with at least one pressure gauge and an American Society of Mechanical Engineers (ASME) safety valve of the proper design.
* A safety (spring loaded) release valve shall be installed to prevent the receiver from exceeding the maximum allowable working pressure.

1. **Air Distribution Lines**

* Air lines shall be made of high quality materials, fitted with secure connections.
* Hose connections shall be properly secured to avoid hose coming loose during use.
* Only standard fittings shall be used on air lines.
* Operators shall avoid bending or kinking air hoses.
* Air hoses shall not be placed where they will create tripping hazards.
* Air lines shall be inspected frequently for defects, and any defective equipment repaired or replaced immediately.
* All compressed air pipelines, pipes, hoses, and fittings must have their maximum working air pressure (pounds per square inch, psi) identified.

1. **Pressure Regulation Devices**

* Only qualified personnel shall be allowed to repair or adjust pressure regulating equipment.
* All safety valves shall be tested frequently and at regular intervals to determine whether they are in good operating condition.
* Safety valves, indicating/controlling devices, gauges and other safety appliances shall be constructed, located, and installed on compressor equipment in such a way that cannot be made inoperative by any means.
* Air tank safety valves shall be set no less than 15 psi or 10 percent (whichever is greater) above the operating pressure of the compressor but never higher than the maximum allowable working pressure of the air receiver.
* Air lines between the compressor and receiver shall usually not be equipped with stop valves. Where stop valves are necessary and authorized, ASME safety valves shall be installed between the stop valves and the compressor.
* The safety valves shall be set to blow at pressures slightly above those necessary to pop the receiver safety valves.
* Safety valves shall be located on the equipment and shielded so sudden blow offs will not cause personnel injuries or equipment damage.
* Case iron seat or disk safety valves shall be ASME approved and stamped for intended service application.
* If the design of a safety or a relief valve is such that liquid can collect on the discharge side of the disk, the valve shall be equipped with a drain at the lowest point where liquid can collect.
* Safety valves exposed to freezing temperatures shall be located so water cannot collect in the valves. Frozen valves must be thawed and drained before operating the compressor.

1. **Air Compressor Operation**

* The operator shall review and be familiar with the Compressed Air safety program.
* Air compressor equipment shall be operated only by authorized and trained personnel.
* The air intake shall be from a clean, outside, fresh air source. Screens or filters can be used to clean the air.
* Air compressors shall never be operated at speeds faster than the manufacturer’s recommendation.
* Equipment shall not become overheated.
* Moving parts, such as compressor flywheels, pulleys, and belts that could be hazardous shall be effectively guarded.
* A high temperature and/or carbon monoxide alarm must be installed on oil-lubricated compressors.
* Air supply shutoff valves shall be located (as near as possible) at the point-of-operation.

1. **Compressed Air Equipment Maintenance**

* Only authorized and trained personnel shall service and maintain air compressor equipment.
* Exposed, noncurrent-carrying, metal parts of compressor shall be effectively grounded.
* High flash point lubricants shall not be used on compressors because of its high operating temperatures that could cause a fire or explosion.
* Equipment shall not be over lubricated.
* Gasoline or diesel fuel powered compressors shall not be used indoors.
* Equipment placed outside but near buildings shall have the exhausts directed away from doors, windows and fresh air intakes.
* Soapy water or lye solutions can be used to clean carbon deposits from compressor parts, but kerosene or other flammable substances shall not be used. Frequent cleaning is necessary to keep compressors in good working condition. (Review MSDS for each cleaning agent used prior to use.)
* The air systems shall be completely purged after each cleaning.
* During maintenance work, the switches of electrically operated compressors shall be locked open and tagged to prevent accidental starting.
* Portable electric compressors shall be disconnected from the power supply before performing maintenance.

1. **Training**

Training shall be performed upon initial employment and/or job reassignment. Periodic refresher training shall also be conducted at the discretion of the supervisor or Safety Department.

All affected employees will be trained in:

* Hazards of cleaning with compressed air.
* Identifying damage and defects in compressed air equipment.
* Operation, inspection and maintenance of compressed air equipment.
* Use of hearing protection.