

LOTO

# Types of energy

- Electrical
- Mechanical
- Thermal
- Hydraulic
- Pneumatic

# Electrical

- When using Lockout Tagout for electrical sources, you must shut down the primary source(breaker not a machine switch), because power can still come through.
- For electrical Lockout Tagout, verify the machine has no power before beginning work. Use your volt meter, check twice to ensure no power.

# Mechanical

- Mechanical energy can come in
  - Kinetic- pulleys, fan blades
  - Stored- springs,
- When locking out mechanical energy, ensure you have addressed kinetic AND potential energy.

# Pneumatic

- Pneumatic power is air pressure, such as from the compressor.
- To service the air lines, the system must be completely deenergized, by bleeding/venting the air pressure.
- Pneumatic power can often be coupled with electrical, mechanical or hydraulic power. Isolating just one of these is not enough, you must isolate all sources.

# Thermal

- Thermal energy can be hot OR cold.
- When locking out thermal energy, you should use an infrared thermometer to ensure the machine temperature is not too hot/cold to work on.
- Wait for the surface temperature to adjust before working on it.

# Hydraulic

- Hydraulic power can be stored under pressure, so part of the Lockout Tagout process is to drain the pressure/fluid into an appropriate container.

# 6 Steps for safe Lockout Tagout

- **1: Prepare for Shutdown**

- This includes gathering all the proper tools, equipment and LOTO equipment needed for the job.
- Check machine specific procedure to ensure you know how to shut down and have the required equipment.
- Notify all affected employees.
- Locate and verify all the energy sources that power the equipment.



# 6 Steps for safe Lockout Tagout

- **2: SHUTDOWN**
- Follow all normal shutdown procedures
- Follow all shutdown procedures on the machine specific shutdown procedures.

# 6 Steps for safe Lockout Tagout

- **3: Isolate all energy sources**
- Each source of identified energy should be isolated at it's source.
  - Example: Don't just flip the switch at the machine, lockout the breaker in the electrical panel.

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- When power is isolated and shutoff, secure it with your lock and a tag.
  - Ensure your name is on the lock and tag.
  - Ensure the lock is secured and the key is on your person.
  - Make sure you apply a lock at each isolated energy source.

# 6 Steps for safe Lockout Tagout

- **5: Release/Check stored and/or residual energy**
- Check the machine to ensure all stored and/or residual energy is secured or released.
  - This can include ensuring valves for air are bled, fluids are drained, or moving parts are blocked.

# 6 Steps for safe Lockout Tagout

- **6: Verify equipment isolation/deenergization**
- Check incoming power to control switches to the machine with a volt meter.
- Attempt to start the equipment
- Once verified, you can begin work.
- If equipment is not isolated, go back to step 1.

# Additional Information

- For more information on specific lockout devices
- [https://www.youtube.com/watch?v=sV-pDDo4nbl&list=PLrwC7w2gy7iN02XzgGbwc\\_YeifGS1es7V](https://www.youtube.com/watch?v=sV-pDDo4nbl&list=PLrwC7w2gy7iN02XzgGbwc_YeifGS1es7V)

# Affected employees

- OSHA defines an Affected Employee as:
  - An employee who is required to use machines or equipment on which servicing is performed under the Lockout/Tagout standard or who performs other job responsibilities in an area where such servicing is performed.



# What is Lockout Tagout?

- Lockout Tagout is a safeguard for employees when repairing or maintaining machines or equipment to ensure all potential sources of energy are neutralized to prevent potential dangerous working conditions.
- Lockout Tagout is only done by trained personnel.

# Lockout Tagout; what do I need to know?

- Be aware when someone tells you they will be locking out a piece of equipment, that that equipment and connected pieces of equipment may not be in service.
- Do not attempt to restart the locked out equipment until you are told it is clear of all personnel.
- Do NOT attempt to remove any of the lockout devices or tags.

Safety is everyone's responsibility.

