

# LOCK OUT / TAG OUT



**L**ock Out/Tag Out incidents are among the top 10 most frequent workplace accidents according to OSHA. Most industrial accidents are caused by unexpected energization or start-up of machines/equipment or by the uncontrolled release of energy.

## What is “Lock Out/Tag Out”?

Lock Out/Tag Out (LOTO) is a security system in a work activity by turning off energy sources then locks it and gives a tag. It refers to specific practices and procedures to safeguard employees from the unexpected energization or startup of machinery and equipment, or the release of hazardous energy during service or maintenance activities. This requires, in part, that a designated individual turns off and disconnects the machinery or equipment from its energy source before performing service or maintenance and that the authorized employee either lock or tag the energy-isolating device to prevent the release of hazardous energy and take steps to verify that the energy has been isolated effectively. If the potential exists for the release of hazardous stored energy or for the re-accumulation of stored energy to a hazardous level, the employer must ensure that the employee take steps to prevent injury that may result from the release of the stored energy.

## What are scope and applicability of Lock Out/Tag Out?

Scope and applicability of LOTO procedure includes several things, namely:

- LOTO procedure establishes the requirements for isolating hazardous energy servicing or maintenance of equipment where the unexpected energization or startup of the equipment or release of stored energy could cause injury to personnel.
- LOTO procedure applies to the control of all forms of hazardous energy including but not limited to electrical, hydraulic, pneumatic, mechanical, chemical, thermal, radiation from radiation generating machines, and other potentially hazardous sources such as toxic substances contained within a system.
- LOTO procedure applies to all personnel, contractors/subcontractors, and vendors.

LOTO procedure does not cover:

- Hot-tap operations involving transmission and distribution systems for substances such as gas, water, steam, or petroleum products when performed on pressurized pipelines provided that all of the following conditions are met.
  - Continuity of service is essential
  - Shutdown of the system is impractical
  - Documented programs are followed and special equipment is used which will provide proven effective personnel protection.



Figure 1. Lock Out/Tag Out (LOTO)

- Installations under the control of electric utilities for the purpose of power generation, transmission, and distribution, including related equipment for communication or metering.
- Energized electrical conductors and circuit parts that operate at less than 50 volts to ground if there is no increased exposure to electrical burns or to explosion due to electric arcs.
- Work on cord-and-plug-connected electric equipment for which exposure to the hazards of unexpected energization or startup of the equipment is controlled by the unplugging of the equipment from the energy source and by the plug being under the exclusive control of the employee performing the servicing or maintenance.
- When physical separation from the hazardous energy source is achieved and properly identified by tags/configuration management documentation.

**What is the requirement of Lock Out/Tag Out device?**

Lock Out/Tag Out must be the only devices uses in conjunction with energy-isolating devices to control hazardous energy. It must be singularly identified and not used for other purposes. In addition, they must have the following characteristics:

- Durable enough to withstand workplace conditions. Tag out devices must not deteriorate or become illegible even when used with corrosive components such as acid or alkali chemicals or in wet environments.
- Standardized according to color, shape, or size. Tag out devices also must be standardized according to print and format. Tags must be legible and understandable by all employees. They must warn employees about the hazards if the machine is energized, and offer employees clear instruction such as: “Do Not Start,” “Do Not Open,” “Do Not Close,” “Do Not Energize,” or “Do Not Operate.”
- Substantial enough to minimize the likelihood of premature or accidental removal. Employees should be able to remove locks only by using excessive force with special tools such as bolt cutters or other metal-cutting tools. Tag attachments must be non-reusable, self-locking, and non-releasable, with a minimum unlocking strength of 50 pounds. Tags must be attachable by hand, and the device for attaching the tag should be a one-piece nylon cable tie or its equivalent so it can withstand all environments and conditions.
- Labeled to identify the specific employees authorized to apply and remove them.

**Lock Out Device:**

- A lock out device shall include a lock (either keyed or combination).
- The lock out device shall include a method of identifying the individual who installed the lock out device.
- A lock out device shall be permitted to be only a lock, if the lock is readily identifiable as a lock out device, in addition to having a means of identifying the person who installed the lock.

- Lock out devices shall be attached to prevent operation of the disconnecting means without resorting to undue force or the use of tools.
- Where a tag is used in conjunction with a lock out device, the tag shall contain a statement prohibiting unauthorized operation of the disconnecting means or unauthorized removal of the device.
- Lock out devices shall be suitable for the environment and for the duration of the lock out.
- Whether keyed or combination locks are used, the key or combination shall remain in the possession of the individual installing the lock or the person in charge, when provided by the established procedure.

**Tag Out Device:**

- A tag out device shall include a tag together with an attachment means.
- The tag out device shall be readily identifiable as a tag out device and suitable for the environment and duration of the tag out.
- A tag out device attachment means shall be capable of withstanding at least 224.4 N (50 lb) of force exerted at a right angle to the disconnecting means surface. The tag attachment means shall be non-reusable, attachable by hand, self-locking, non-releasable, and equal to an all environmental tolerant nylon cable tie.
- Tags shall contain a statement prohibiting unauthorized operation of the disconnecting means or removal of the tag. A hold card tagging tool on an overhead conductor in conjunction with a hotline tool to install the tag out device safely on disconnect that is isolated from the work shall be permitted.

**Reference:**

- [1]NFPA 70E Standard for Electrical Safety in the Workplace; 2012 Edition
- [2]OSHA 3120 Control of Hazardous Energy (Lockout/Tagout); 2002 (Revised)
- [3]ANSI/ASSE Z244.1, Control of Hazardous Energy – Lockout/Tagout and Alternative Methods; 2003 (R 2008)

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