

Robotics Safety Fact Sheet

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Across Texas and the nation, thousands of robots are on the job in manufacturing, warehousing, construction, and other industries. These tools make work faster, more precise, and safer for people. But when humans and robots share workspaces, new risks arise: accidental collisions, electrical hazards, or machinery malfunctions can happen if safety measures are not followed.



Common hazards with industrial and construction robotics

- **Struck or caught in moving machinery.** Robots can move unexpectedly or at high speed. Workers can be struck, pushed, or pinned if a worker enters the robot's operating area.
- **Electrical risks.** Most robots require high-voltage power, increasing the risk of electric shock if equipment is damaged or maintained improperly.
- **Programming and maintenance accidents.** Many serious injuries occur during non-routine tasks such as setting up, testing, repairing, or cleaning robots.
- **Unsafe behaviors.** Distraction, fatigue, poor communication, or lack of training can cause risky exposure to robot work zones.
- **Environmental hazards.** Loud noise, vibration, and hazardous materials sometimes go with robotic tasks, leading to chronic health effects, such as hearing loss, musculoskeletal disorders, and more.

Robots on the job

Robots are not limited to one type of job. Common workplaces for robotics include:

- **Manufacturing:** assembly lines, welding, and machine tending.
- **Warehousing:** order picking, packaging, and palletizing.
- **Construction:** heavy lifting, demolition, and concrete pouring.
- **Delivery and logistics:** sorting, transporting, and inventory.
- **Food processing and petrochemical plants:** repetitive or hazardous tasks.

In any setting, put a robotics safety program in place if a machine is working alongside employees.

Preventing robot-related injuries

Use these controls to improve safety in workplaces where robots operate:

- **Separate human and robot work areas.** Use barriers, fencing, floor tape, warning signs, light curtains, and safety mats to keep people from entering robotic work zones while a machine is running.

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- **Implement emergency stops and [lockout/tagout](#) procedures.**

Make sure employees know how to safely shut down robots during repair, cleaning, or emergencies so hazardous energy doesn't remain stored.

- **Link safety devices to robot controls.** Safety sensors, alarms, and interlocks should automatically stop robot motion if a worker enters a danger area.
- **Conduct risk assessments and training.** Before introducing robots, inspect the area, map out all hazards, and train everyone on safe operating practices and emergency responses.
- **Require personal protective equipment (PPE) and safe practices:** Require safety glasses, fitted clothing, tied-back hair, and clear safety rules to prevent injuries from entanglement and flying debris.
- **Maintain and inspect equipment regularly:** Keep all robotic systems and safety equipment in good working order with scheduled checks and prompt repairs.



Building a robotics safety program

A strong safety program for robotics includes more than machines. It starts with planning and practical protections for every worker.

- **Perform a risk assessment** before and after installing or updating any robotic system.
- **Design workplaces to separate people from active robots** unless collaboration is needed.
- **Require thorough training**, especially for programming, repair, and emergency procedures.
- **Combine control measures**, including engineering controls (barriers, sensors), administrative controls (rules, check-ins) and PPE.

With the right mix of technology, safety measures, and smart training, robots and employees can work together safely and efficiently — preventing injuries and saving lives.

For more information, review [OSHA's Technical Manual \(OTM\) Section IV: Chapter 4 Industrial Robot Systems and Industrial Robot System Safety](#), [NIOSH's Preventing the Injury of Workers by Robots](#), DWC's Safety@Work: [Robotics in Construction](#), or contact a DWC safety training specialist at safetytraining@tdi.texas.gov.





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