

MATERIAL HANDLING PROGRAM

PURPOSE / SCOPE

The policy of Winger Companies, herein referred to as Winger, is to perform work in the safest possible working conditions for its employees' work place. It is each employee's responsibility to ensure they are performing their job in the safest most efficient manner possible.

The purpose of the Winger Material Handling Program is to inform its employees of the efficient handling and storing of materials. These operations provide a continuous flow of raw materials, parts, and assemblies through the workplace, and ensure that materials are available when needed. Yet, the improper handling and storing of materials can cause costly personal injuries.

Lifting heavy items is one of the leading causes of injury in the workplace. In 2001, the Bureau of Labor Statistics reported that over 36 percent of injuries involving missed workdays were the result of shoulder and back injuries. Overexertion and cumulative trauma were the biggest factors in these injuries.

When employees use smart lifting practices and work in their "power zone," they are less likely to suffer from back sprains, muscle pulls, wrist injuries, elbow injuries, spinal injuries, and other injuries caused by lifting heavy objects.

GENERAL REQUIREMENTS

OSHA applicable standards are found in CFR 1910, Subpart N and CFR 1926, Subpart H – Materials Handling and Storage. Following are the general requirements for Winger employees:

- Storage areas shall be kept free from accumulation of materials that constitute hazards from tripping, fire, explosion, or pest harborage. Vegetation control will be exercised when necessary.
- All materials stored in tiers shall be stacked, racked, blocked, interlocked, or otherwise secured to prevent sliding, falling or collapse.
- Scrap material and debris shall be piled neatly in work area and disposed of properly as work progresses.
- Materials shall not be stored on scaffolds or runways in excess of supplies needed for immediate operations.
- Whenever materials are dropped more than 20 feet to any point lying outside the exterior walls of the building, an enclosed chute of wood, or equivalent material, shall be used.
- Materials stored inside buildings under construction shall not be placed within 6 feet of any hoist-way or inside floor openings, or within 10 feet of an exterior wall which does not extend above the top of the material stored.
- All stacked loads must be correctly piled and cross-tiered, where possible.
- When stacking materials, consider the need for availability of the material. Material that cannot be stacked due to size, shape, or fragility can be safely stored on shelves or in bins.
- Structural steel, bar stock, poles, pipe, and other cylindrical materials, unless in racks, must be stacked and blocked to prevent spreading or tilting.
- Blocking materials and timbers should be large and strong enough to support the load safely.
- Blocking materials with evidence of cracks, rounded corners, splintered pieces, or dry rot should not be used for blocking.
- Follow hoist manufacturer's instructions when using hoist equipment.

POTENTIAL HAZARDS WHEN MOVING MATERIALS

Workers can be injured by falling objects, improperly stacked materials, or by various types of equipment. When manually moving materials, however, workers should be aware of:

- ⊕ Strains and sprains from improperly lifting loads, or from carrying loads that are either too large or too heavy.
- ⊕ Fractures and bruises caused by being struck by materials, or by being caught in pinch points.
- ⊕ Cuts and bruises caused by falling materials that have been improperly stored, or by incorrectly cutting ties or other securing devices.
- ⊕ Employees should seek help when a load is so bulky it cannot be properly grasped or lifted, when they cannot see around or over it, or when a load cannot be safely handled.
- ⊕ When an employee is placing blocks under raised loads, the employee should ensure that the load is not released until his or her hands are clearly removed from the load.
- ⊕ Handles and holders should be attached to loads to reduce the chances of getting fingers pinched or smashed.
- ⊕ Workers should use appropriate protective equipment.
- ⊕ For loads with sharp or rough edges, wear gloves or other hand and forearm protection.
- ⊕ To avoid injuries to the hands and eyes, use gloves and eye protection.
- ⊕ When the loads are heavy or bulky, the mover should also be wearing safety-toed work boots with either composite or steel toes, to prevent foot injuries if the worker slips or accidentally drops a load.
- ⊕ When mechanically moving materials, avoid overloading the equipment by letting the weight, size and shape of the material being moved dictate the type of equipment used for transporting it.
- ⊕ All materials handling equipment has rated capacities that determine the maximum weight the equipment can safely handle and the conditions under which it can handle those weights.
- ⊕ The equipment-rated capacities must be displayed on each piece of equipment and must not be exceeded except for load testing.
- ⊕ When picking up items with a powered industrial truck, the load must be centered on the forks and as close to the mast as possible, to minimize the potential for the truck tipping or the load falls.
- ⊕ A lift truck must never be overloaded because it would be hard to control and could easily tip over.
- ⊕ Extra weight must not be placed on the rear of a counterbalanced forklift to offset an overload.
- ⊕ The load must be at the lowest position for traveling, and the truck manufacturer's operational requirements must be followed.
- ⊕ All loads or equipment must be secured to prevent shifting while in transit.
- ⊕ Precautions also should be taken when stacking and storing materials.

WEIGHT OF OBJECTS

Some loads, such as large spools of wire, bundles of conduit, or heavy tools and machinery place great stress on muscles, discs, and vertebrae. Lifting loads heavier than about 50 pounds will increase the risk of injury. Here are some possible solutions:

- ⊕ Use mechanical means such as forklifts or duct lifts to lift heavy spools, transformers, switch gear, service sections, conduit, and machinery.
- ⊕ Use pallet jacks and hand trucks to transport heavy items.
- ⊕ Avoid rolling spools. Once they are in motion, it is difficult to stop them.
- ⊕ Use suction devices to lift junction boxes and other materials with smooth, flat surfaces. These tools place a temporary handle that makes lifting easier.
- ⊕ Use ramps or lift gates to load machinery into trucks rather than lifting it.





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- ⊕ Materials that must be manually lifted should be placed at "power zone" height, about mid-thigh to mid-chest. Special care should be taken to ensure proper lifting principles are used. Maintain neutral and straight spine alignment whenever possible. Usually, bending at the knees, not the waist, helps maintain proper spine alignment.
- ⊕ Place materials that are to be manually lifted at "power zone" height, about mid-thigh to mid-chest. Maintain neutral and straight spine alignment whenever possible. Usually, bending at the knees, not the waist, helps maintain proper spine alignment.
- ⊕ Order supplies in smaller quantities and break down loads off-site. When possible, request that vendors and suppliers break down loads prior to delivery.
- ⊕ Refabricate items in a central area where mechanical lifts can be used. Only transport smaller, finished products to the site.
- ⊕ Limit weight you lift to no more than 50 pounds. When lifting loads heavier than 50 pounds, use two or more people to lift the load.
- ⊕ Work with suppliers to make smaller, lighter containers.



AWKWARD POSTURES

Bending while lifting forces the back to support the weight of the upper body in addition to the weight you are lifting. Bending while lifting places strain on the back even when lifting something as light as a screwdriver. Bending moves the load away from the body and allows leverage to significantly increase the effective load on the back. This increases the stress on the lower spine and fatigues the muscles.

Reaching moves the load away from the back, increases the effective load, and places considerable strain on the shoulders. Carrying loads on one shoulder, under an arm, or in one hand, creates uneven pressure on the spine. Poor housekeeping limits proper access to objects being lifted and forces awkward postures. Here are some possible solutions:

- ⊕ Move items close to your body and use your legs when lifting an item from a low location.
- ⊕ Store and place materials that need to be manually lifted and transported at "power zone" height, about mid-thigh to mid-chest.
- ⊕ Minimize bending and reaching by placing heavy objects on shelves, tables, or racks. For example, stack spools on pallets to raise them into the power zone.



- ⊕ Avoid twisting, especially when bending forward while lifting. Turn by moving the feet rather than twisting the torso.
- ⊕ Keep your elbows close to your body and keep the load as close to your body as possible.
- ⊕ Keep the vertical distance of lifts between mid-thigh and shoulder height. Do not start a lift below mid-thigh height nor end the lift above shoulder height. Lifting from below waist height puts stress on legs, knees, and back. Lifting above shoulder height puts stress on the upper back, shoulders, and arms.
- ⊕ Break down loads into smaller units and carry one in each hand to equalize loads. Use buckets with handles, or similar devices, to carry loose items.
- ⊕ Keep the load close to the body. When lifting large, bulky loads, it may be better to bend at the waist instead of at the knees in order to keep the load closer to your body.
- ⊕ Optimize employee access to heavy items through good housekeeping and preplanning.
- ⊕ Use roll-out decks installed in truck beds to bring materials closer to the employee and eliminate the need to crawl into the back of a truck. See the Vehicular Activities section for more information.

HIGH FREQUENCY AND LONG-DURATION LIFTING



- ⊕ Holding items for a long period of time, such as when installing fixtures or j-boxes, even if loads are light, increases risk of back and shoulder injury, since muscles can be starved of nutrients and waste products can build up. Repeatedly exerting, such as when pulling wire, can fatigue muscles by limiting recuperation times. Inadequate rest periods do not allow the body to rest. Here are some possible solutions:
- ⊕ Use a template made of a lightweight material such as cardboard to mark holes for drilling when mounting heavy items such as junction boxes and service panels. This ensures that the heavier item does not need to be held in place to level and measure for anchor mounts.
- ⊕ Provide stands, jigs, or mechanical lifting devices such as duct lifts to hold large, awkward materials such as junction boxes and service panels in place for fastening.
- ⊕ Rotate tasks so employees are not exposed to the same activity for too long.

- ⊕ Work in teams; one employee lifts and holds items while the other assembles.
- ⊕ Take regular breaks and break tasks into shorter segments. This will give muscles adequate time to rest. Working through breaks increases the risk of musculoskeletal disorders (MSDs), accidents, and reduces the quality of work because employees are overfatigued.
- ⊕ Plan work activities so employees can limit the time they spend holding loads.
- ⊕ Pre-assemble work items such as fixtures or boxes to minimize the time employees spend handling them.

INADEQUATE HANDHOLDS

Inadequate handholds make lifting more difficult, move the load away from the body, lower lift heights, and increase the risk of contact stress and of dropping the load:

- ⊕ Utilize proper handholds, including handles, slots, or holes, with enough room to accommodate gloved hands.
- ⊕ Ask suppliers to place their materials in containers with proper handholds.
- ⊕ Move materials from containers with poor handholds or without handholds into containers with good handholds.
- ⊕ Wear proper personal protective equipment (PPE) to avoid



finger injuries and contact stress. Ensure that gloves fit properly and provide adequate grip to reduce the chance of dropping the load.

- ⊕ Use suction devices to lift junction boxes and other materials with smooth, flat surfaces. These tools place a temporary handle that makes lifting easier.

ENVIRONMENTAL FACTORS

Cold temperatures can cause decreased muscle flexibility, which can result in muscle pulls. Excessively hot temperatures can lead to dehydration, fatigue, and increased metabolic load. Low visibility or poor lighting increases the chance of trips and falls. Here are some possible solutions:

- ⊕ Adjust work schedules to minimize exposure to extreme temperatures.
- ⊕ Wear warm clothing when exposed to cold temperatures.
- ⊕ Drink lots of water to avoid dehydration in excessive heat.
- ⊕ Provide proper lighting for areas with low light and perform work during daylight hours.



HAZARDOUS MATERIAL STORAGE & DISPOSAL

- ⊕ Flammable material is always stored in separate closed containers.
- ⊕ Store and transport gasoline, when in amounts of 5 gallons or less, in safety cans only. Plastic gas cans are not to be used.
- ⊕ Incompatible chemical products (which may cause a hazardous reaction if they come in contact) shall not be stored together.
- ⊕ Flammable liquids are not to be stored near sources of ignition (sparks, electricity, flames, or hot objects).
- ⊕ Where more than 25 gallons of flammable liquids are present, they are to be kept in a storage cabinet approved by the Nation Fire Protection Association (NFPA).
- ⊕ Flammable and combustible scrap, debris, and waste are to be removed promptly from buildings or structures.
- ⊕ Appropriate cleanup materials are available for leaks or spills of flammables or other hazardous materials.
- ⊕ Secure compressed gas cylinders in an upright position. Gauges must be removed and caps must be on when stored. ANSI Z49.1:2005, 8.6.4 & 5 Standard says Cylinder valves should be closed and capped when equipment is unattended for an extended time, such as for several days.
- ⊕ Oxygen cylinders in storage shall be separated from fuel-gas cylinders or combustible materials (especially oil or grease), a minimum distance of 20 feet or by a non-combustible barrier at least 5 feet high having a fire-resistance rating of one-half hour.
- ⊕ Leftover hazardous products and waste are to be properly stored, labeled, and disposed of according to the instructions on the product's Material Safety Data Sheet (MSDS).

TRAINING

OSHA recommends using a formal training program to reduce materials handling hazards. Instructors should be well-versed in matters that pertain to safety engineering and material handling and storing. The content of the training should emphasize those factors that will contribute to reducing workplace hazards including the following:

- ⊕ Alerting the employee to the dangers of lifting without proper training.
- ⊕ Showing the employee how to avoid unnecessary physical stress and strain.
- ⊕ Teaching workers to become aware of what they can comfortably handle without undue strain.
- ⊕ Reinforce using the proper material handling equipment for heavy and awkward loads.

- Instructing workers on the proper use of equipment.
- Teaching workers to recognize potential hazards and how to prevent or correct them.
- Because of the high potential for back injuries, safe lifting techniques for manual lifting should be demonstrated and practiced at the work site by supervisors as well as by employees.
- A training program to teach proper lifting techniques should cover the following topics:
 - Awareness of the health risks to improper lifting — citing organizational case histories.
 - Knowledge of the basic anatomy of the spine, the muscles, and the joints of the trunk, and the contributions of intra-abdominal pressure while lifting.
 - Awareness of individual body strengths and weaknesses—determining one's own lifting capacity.
 - Recognition of the physical factors that might contribute to an accident, and how to avoid the unexpected.
 - Use of safe lifting postures and timing for smooth, easy lifting and the ability to minimize the load-moment effects.
 - Use of handling aids such as stages, platforms, or steps, trestles, shoulder pads, handles, and wheels.
 - Knowledge of body responses—warning signals—to be aware of when lifting.

SUMMARY

It is the desired intent to keep our employees aware of the dangers and hazards while at their workplace.

SOURCE CREDITS

U.S. Department of Labor, Occupational Safety and Health Administration, www.osha.gov
Mechanical Contractors Association of America, www.mcaa.org
Industrial Accident Prevention Association (IAPA)
National Institute for Occupational Safety and Health (NIOSH)
U.S. Department of Transportation, Federal Motor Carrier Safety Administration
Hoist Manufacturers Institute (HMI)
Cambridge Integrated Services Group, Inc., Risk Control Division
Plastics Pipe Institute, www.plasticpipe.org
Michigan Occupational Safety and Health Administration, Consultation Education and Training Division
Arkansas Workers' Compensation Commission, Health and Safety Division

DOCUMENT CONTROL

Initial Program December 27, 2006

Revised February 27, 2009

Revised June 14, 2011

Revised January 16, 2012

Revised October 7, 2012

Revised January 21, 2013

Revised April 2, 2013

Reviewed April 8, 2015

Revised October 19, 2016

Revised September 13, 2017

Revised July 24, 2018

Revised October 4, 2018