

INDUSTRIAL, COMMERCIAL, INSTITUTIONAL: INSULATORS

Photocopy this profile and distribute it as widely as possible!

Musculoskeletal disorders (MSDs), such as chronic back pain or shoulder problems, often take time to develop. Forceful exertion, awkward positions, hand-arm and whole-body vibration, contact stress, and repetitive tasks can add up over time to produce an MSD.

This profile can help you identify and control MSD hazards in your job. We recommend that you add the best practices outlined here to your company's health and safety program. The hazards in a particular job, however, may be different than the ones on this profile, so evaluate the risks of your specific work activities.

When implementing MSD controls, consider the following ergonomic principles:

- 1. Use handling equipment when possible.** The best way to prevent an MSD is to eliminate or reduce the need for lifting, carrying, pushing, and pulling. Instead, use material-handling equipment such as carts, dollies, pallet jacks, or manual forklifts.
- 2. Don't lift a load (cement, roll metals, scaffold, etc.) from the floor.** Lifting from the floor or from below standing knuckle height can put severe stress on your back and reduce your lifting ability. To avoid this, store objects above standing knuckle height and below standing shoulder level.
- 3. Avoid working on the floor.** Constantly working on the floor can result in injuries to your back, hips, and knees because you usually have to kneel and bend forward. When possible, raise the work height by using a workbench.
- 4. Avoid working above your shoulders.** High lifting or constantly reaching above your shoulders can be harmful. Most of the work is being done by the smaller muscles in your shoulders and arms instead of by the larger muscles in your back and legs. When your arms are raised, the muscles fatigue more quickly because there is less blood flow. Also, there is a greater chance you could drop the object.
- 5. Get help with large loads or move smaller loads more often.** Get help from a co-worker if a load is too heavy for you to handle on your own. If possible, divide the load into smaller loads. Smaller weights put less stress on your back than larger weights, even if you have to make more trips.
- 6. Consider exercise programs.** Regular exercise not only helps prevent MSDs but also promotes general good health.
- 7. Use proper lifting and handling techniques.** Using the wrong technique puts extra stress on your lower back and can also cause a traumatic injury such as a fall or a struck-by injury. For proper lifting techniques, refer to the "Back Care" chapter in IHSA's *Construction Health and Safety Manual* (M029).

Industrial Applications

| Tasks | What can happen (Hazards/Risks) | Potential Controls |
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| <p>Installing insulation, removable covers, and protective finishes for piping, fittings, tanks, vessels, and equipment</p> <ul style="list-style-type: none"> ▶ Selecting insulation and protective materials ▶ Fabricating insulation and protective materials ▶ Cutting insulation and protective materials ▶ Fitting insulation systems and protective materials ▶ Fastening insulation and protective materials | <ul style="list-style-type: none"> ▶ Awkward postures from working in confined spaces, working overhead, and working below knee level ▶ Overexertion injuries from manually handling materials | <ul style="list-style-type: none"> ▶ Assess the MSD hazards of the job tasks and implement controls before starting work to avoid overexertion and awkward postures. ▶ Plan ahead to minimize material handling tasks. ▶ Use portable mechanical lifting equipment whenever you can, particularly when loading or unloading heavy materials. Material handling equipment can include a Genie lift, a light mobile overhead crane, or a powered buggy. Workers should be trained to operate these types of equipment. ▶ Choose the most appropriate make and model of hoist and balancer for your task. There are also a variety of attachments to lift different objects. Ensure the hoist is rated for the required load weight. ▶ Use motorized pallet jacks when moving material frequently or over long distances. ▶ When using carts or hand trucks: <ul style="list-style-type: none"> ○ Select a model that has the type of wheels that are appropriate for the ground conditions. ○ Models with swivel wheels on the rear and fixed wheels on the front are easier to push over long distances. ○ Maintain the wheels on handling equipment. ○ Handles should be located at the rear of the cart and at waist level. ○ The height of the load on the cart should not block your view. ○ Keep loads balanced and under the manufacturers' recommended weight limits. ○ Handling equipment is available in many shapes and sizes and can be customized for specific applications. Talk to your purchasing department or supervisor about getting the correct one for your needs. ▶ Push a load rather than pull it. Pulling causes more bone-on-bone compression in the lower back. ▶ Using large containers to store and transport materials, tools, and equipment will reduce material handling tasks and improve efficiency. ▶ Using adjustable height benches with rotating tabletops will allow objects to be easily turned, rotated, and positioned. ▶ A shelving system that can move and store materials, tools, or equipment will allow them to be within easy reach. ▶ Avoid awkward positions when working. Creating a stable work bench will allow you to work while standing upright with your arms close to your sides. |

| Tasks | What can happen (Hazards/Risks) | Potential Controls |
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| | | <ul style="list-style-type: none"> ▶ Using devices that positions your work between knee level and shoulder level will keep the work within arm's reach and allow you to easily access tools and materials. This will lessen the time that is wasted untangling parts, and will reduce the force needed to pull tangled tools apart. ▶ Keeping cutting tools sharp will reduce the amount of force needed to operate them. ▶ If you do a lot of cutting, use a power saw. ▶ Move close to the work area and centre yourself to reduce overreaching and bending at the waist. ▶ Use a scissor lift or other work platform if available. ▶ Use lightweight tools whenever possible. ▶ Select the right tool for the job. Choose tools that fit your hand comfortably. Whenever possible, use power tools that require less force. ▶ Let your supervisor know if you need training on a new tool or process. ▶ Practice good housekeeping. Discard or pick up debris and scrap material to prevent repetitive bending and slips, trips, and falls. Keep pathways clear for carts, wheelbarrows, and dollies. ▶ Change work positions often. Working overhead or in cramped spaces forces the body into awkward positions. To relieve muscle tension and improve circulation, alter your body position, alternate tasks, and stretch throughout the day. ▶ Use a more comfortable handle to lift objects whenever possible. (e.g., You will use a lighter grip when lifting a bucket if you increase the diameter of the handle by adding padding or by using a larger handle.) ▶ Use a three-point lift method when handling heavy objects or long material by yourself: <ol style="list-style-type: none"> 1) squat and lift one end of the object 2) walk up the load 3) lift the object from the ground. ▶ When lifting objects, always keep the load or object close to your body. ▶ Wearing gloves with anti-vibration properties can reduce the vibration being transmitted to your hands and arms from tools such as grinders, needle guns, and sanders. |

| Tasks | What can happen (Hazards/Risks) | Potential Controls |
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| | | <ul style="list-style-type: none"> ▶ Use elbow pads to protect elbows from contact stress. They are very useful when working in cramped spaces. Elbow pads should fit snugly but should not affect the circulation in your arm. ▶ Using a shoulder pad when carrying heavy objects on your shoulder will reduce the strain on your shoulder by spreading the weight over a larger area. ▶ Always use a proper work platform. Work from a ladder only when it is not possible or feasible for you to use a work platform. |
| <p>Installing protective cladding</p> <ul style="list-style-type: none"> ▶ Selecting cladding ▶ Laying out cladding ▶ Fabricating cladding ▶ Assembling cladding components <p>Insulators install protective cladding to protect insulation from weather and mechanical abuse, as well as to enhance its appearance.</p> <p>Cladding is a trade term that may also be called “jacketing” when installing protective covers over pipes, tanks, and vessels.</p> | <ul style="list-style-type: none"> ▶ Lifting and carrying sheet metal materials, supplies, tools, fasteners, and ladders ▶ Hand and arm injuries from constant and repetitive high hand force when gripping sheet metal ducts, powered hand tools, and fasteners ▶ Overexertion injuries from balancing on a swingstage ▶ Kneeling, crawling, and crouching when assembling or installing products ▶ Shoulder and neck problems from static and awkward postures when cladding and welding ▶ Repetitive stress from using a manual button punch | <ul style="list-style-type: none"> ▶ Plan ahead to minimize material handling tasks. (e.g., Deliver and store work materials as close to the installation area as possible.) ▶ Whenever possible, use machines to lift and place large pieces of material (e.g., cranes, telescoping forklifts with appropriate attachments, or boom trucks). Use a tag line to control the material when hoisting from the ground. Don't reach out, push, or pull. Let the equipment do the work. ▶ If mechanical lifting devices are not available, use a power tugger to help pull ropes from a pulley system when lifting cladding materials. ▶ When installing a metal roof deck, use an upright fastening tool (e.g., a Hilti DX 860 or Pneutek) to avoid repetitive bending at the waist. ▶ Use a mechanical or pneumatic punching machine instead of a manual button punch on metal decks. ▶ Using wood planks as spacers can help balance a swingstage. ▶ Picking up garbage and scrap materials as you go can prevent injuries from poor housekeeping. Distribute garbage bins around your site and empty them regularly. ▶ If you can't use mechanical lifting devices, make sure that there are enough workers to lift heavy materials without overexertion. Lifting as a team requires cooperation. ▶ Determine the weight of your load before you lift and get help from a co-worker if it's too much for you to handle on your own. ▶ Always use proper lifting techniques (i.e., lift materials with your legs, do not bend over or lift with your back, keep the load close to your body). Refer to the “Back Care” chapter in IHSA's <i>Construction Health and Safety Manual</i> (M029). |

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