

Ergonomics For Fireproofing



Musculoskeletal Risks in the Fireproofing Industry

SET UP

Proper set up on a fireproofing job can prevent many musculoskeletal injuries among fireproofers and fireproofing tenders.

MIX: Monokote™ mix comes in 46.5-pound bags. You will move 300 to 350 bags (or about 8 tons of mix) a day on a large job. If the pallet is too far away from the mixer, it means unnecessary work.

- Position the pallet as close as possible to the mixer. A pallet jack is helpful in maneuvering the pallet.
- Bags are stacked on a pallet in 10 levels of five bags. A scissor lift can raise the pallet as bags are pulled off, which reduces bending when moving the last layers of bags.
- A platform behind the mixer allows you to work at a comfortable height.
- If the platform is built outside of the material trailer, the platform height should be level with the trailer so materials can be carried directly onto the mixing platform.
- Bags would benefit from a redesign. Handles would

make them easier to lift, carry, and open.

WATER: Most jobs have an automatic or mechanical system to supply water to the mixer. On small jobs, water is often scooped out of 55-gallon drums with a 5-gallon bucket. Five gallons of water weighs over 40 pounds and is awkward to lift from inside a drum.

- If you are using a bucket to supply water to the mixer, never carry more than 3 gallons at a time. Move the water drum as close as possible to the mixer.

HOSES: Hoses come in 50-foot lengths and in various diameters from about 3 inches (nearest the pump) to about 1 inch (by the nozzle). A 50-foot section of hose can weigh over 100 pounds.

- A flatcar to move the hoses around the site is useful.
- Have spare connectors on the site in case any get damaged.

SCAFFOLDING: Rolling scaffolds are usually used for fireproofing work.

- Use scaffolding with floor grates, if possible, because the spray will fall through. Grates

are easier to clean. They are heavy to assemble, however. Aluminum planking with hooked ends is a good alternative. It is lighter and easy to clean.

CANVASES: Canvases are used to keep fireproofing material from falling outside the building. They are approximately 16 feet by 20 to 25 feet. They get heavy when dirty. Canvases can catch the wind, creating a sail effect, which makes them hard to control. It is awkward putting up canvases because you have to lean over the guardrail.

TENDING

THE MIXER: Tending the mixer includes feeding in the mix and water and keeping the mixer clean.

- It may be possible on large jobs to get a hopper to feed measured amounts of mix into the mixer.
- Washing out the mixer each hour keeps it clean and reduces cleanup at the end of the day. If the mix hardens in the mixer, it is much more difficult to clean.
- It may be possible to coat the inside of the mixer with diesel

fuel or similar coating to keep the mix from adhering to the mixer. Make sure it would not affect the fireproofing, though.

THE HOSES: Moving hoses is hard work if done incorrectly. Here are some tips:

- Continually move the hose a few feet at a time. If you wait to move the hose a long way it is much harder to move.
- Use a rope or hook (like a Handhook) to make it easier to move hoses.
- Boots with good grips on the soles are important to keep traction on slippery surfaces.
- Coordinate with the sprayer. Always stay ahead of the sprayer, anticipating his or her moves. Teamwork makes the job easier.
- Proper planning also makes the work easier. For example, it is easier to start at a distance and move toward the pump so hoses are laid out empty and will be closer to the pump when you are finished.
- Plan to finish one floor by the end of the workday. Dragging full hoses up a flight of stairs to the next level is hard work.

THE SCAFFOLD: It is the tender's job to move the rolling scaffold after a section has been sprayed.

- Scaffold wheels can get clogged with the sprayed mixture. It is important to keep the wheels clean. A wire brush or bent welding rod makes a good wheel cleaner. These tools can be used to

clean your shoes, too—another necessary task.

MOVING CANVASES: Canvases are pulled up to the next floor when one floor is sprayed.

- Continually cleaning the canvases makes it easier to move them when you are finished with a floor.
- Canvases should be scraped when wet. Dried-on material is harder to clean.
- A bent pipe or piece of conduit can be used to beat the canvas to clean it off.

FLOOR CLEANING: The tender has to remove spray that has fallen on the floor. Use a long-handled scraper with a blade on the end.

- A long handle and wide blade on the scraper will reduce bending and make the job easier.
- Keep the scraper blade sharp.
- Consider adding another handle to the shaft of the scraper or developing a bent-handled scraper. This makes it easier to apply downward force to the scraper.
- Clean continually instead of waiting until the end of the day.
- Scrape the floors when they are wet and before material has hardened.
- Periodically use a scraper to clean the scaffold grating.

SPRAYING: In most cases, tenders do not do the actual spraying; however, following are some tips for sprayers. Spraying is physically demanding due to holding and lifting the hose and constantly

looking overhead all day. Some tips are to:

- Use a tripod or sling to help hold the sprayer.
- Use a “neck pillow” (similar to travel pillows used on airline flights).

CLEAN UP/REPAIRS

HOSES: Hoses are usually drained and cleaned at the end of the day and before they are moved. It may be necessary to rinse them several times in the winter, when they may be filled with antifreeze overnight. The tender walks the length of the hose lifting the hose over his or her shoulder to drain the water.

- If possible, use a reel to roll up the hoses at the end of the day.
- Normally hoses are reeled up and taped together to make them easier to carry. A hose carrier makes it easier to transport hoses. A piece of pipe can be placed through the rolled hose to allow two workers to carry it, one on each side.

Paper, mix, ice, and rocks clog hoses. Clogged hoses have to be uncoupled and unclogged. Often hoses are unclogged by using a hammer or plank on the clog or by ramming a threaded rod or snake through the hose to the clog. Clogs can occur at the couplings. It is harder when they occur in the hose itself because spray can dry and harden in the hose.

- It may be possible to clean clogs using plumber's tools such as a snake attached to a drill or motor.

Normally hoses that need to be repaired are sent out and replaced. Air hoses, which are smaller, are the exception. The tender can replace them and repair the break using a 5/16-nut driver.

FIBERSPRAY PROCESS

Fiberspray comes in larger bags (60 pounds) than Monokotetm. It is a dry product and its plastic hoses are lighter. Water is added at the last minute at the nozzle. It is easier to clean up than Monokotetm because it is both lighter and because only about 115 bags are used each day.