



RISK BULLETIN

Ergonomic Exposures and Controls: Chemical Weighing and Mixing

WORK TASKS

Two employees work as a team to add powdered chemicals to a batch process. One employee transports most loads using a pallet jack to bring the bags of ingredients within a few feet of the mixer. The other employee adds the ingredients to the mixer by lifting the bags (40 pounds) from the pallet and placing the bag onto the edge of the mixer opening. The bag is then slit with a knife and the ingredients are dumped into the mixer. The employee lifts and shakes the bag until it is empty. Additionally, both employees lift bags from a conveyor that brings the items to the proximity of the mixer. They both stand during most of the operation. Employees wear gloves and long sleeves during the bag handling.



EXPOSURE

- Reaching far from the body when lifting bags from the pallet.
- Bending down close to ground-level to lift bags from the pallet.
- Repeated lifting of 40 pounds while twisting to position the bag onto the edge of the mixer opening.
- Long periods of standing.
- The risk of injury is increased as static posture, length of time or repetitions of a movement are increased.
- Repeated and forceful pinch grips to lift, transport and empty sacks of material.
- Frequent torso flexions while bent over the mixer port to empty sacks. The employee who transports the sacks frequently twists when moving sacks from the conveyor to the mixer.

CONTROLS

- Jobs should be classified by the nature and extent of exertion and a rotation schedule should be created that allows for as much variation as possible in the distribution and frequency of musculoskeletal activity.
- Work-rest schedules should be developed and enforced. Generally, a minimum of a 15 minute rest break at least every two hours is required.

- Develop a large batch bin system where ingredients can be automatically ordered and delivered to the batch mixer without lifting bags.
- Add palletizers with rotating turntables to the conveyor. This would allow the transporting employee to always lift from the ideal level of about waist height and to position the load as close to his body as possible. With proper access, the employee should be able to lift the sacks in a manner that does not involve pinch grips. Any system that allows the employee to control and transport the bags without using pinch grips would provide a solution to this problem.
- If the batch mixer port were height and depth adjustable, the mixing employee could greatly reduce his/her use of pinch grips. This would allow him/her closer proximity to the work and he/she could maneuver the sacks without using pinch grips.
- Provide the employee with adjustable equipment such that they can load and unload items at the optimal work height (about belt level). Adjustability should be provided for pallets on the conveyor. The use of palletizers with rotating turntables will permit the employee to always work from the ideal lifting height, as

well as allowing the use of full pallets on the conveyor. Adjustability in height and depth of the mixing station will allow the employee to perform his/her task without repeated torso flexions. Generally, torso flexion should be limited to 6 to 10 degrees. For these lifts the load should be kept close to the body and at about waist height.

- Instruct the employee on how to properly grip the bags while facing the load. Keep the horizontal distance between the bag and the body as low as possible, and avoid twisting at all times while handling loads. Keeping the bag close to the body while turning the feet and not the torso will reduce the twisting hazard.

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