

## National Institute for Occupational Safety and Health (NIOSH)

### How to determine safe limits?

It can be challenging to determine what is a safe weight for workers to lift, push, or pull, largely because there is no set limit that can be applied to every situation or every worker—many variables dictate what is safe.

However, the resource below is one that safety professionals can utilize to help determine and set safe limits.

### Lifting Equation

One of the most utilized resources for determining safe lifting limits is the National Institute for Occupational Safety and Health (NIOSH) Lifting Equation. The NIOSH equation sets a fixed weight of 51 pounds as the load constant (generally considered the maximum load nearly all healthy workers should be able to lift under **optimal** conditions.)

However, recognizing that optimal conditions are almost never present in the workplace, the NIOSH equation uses additional factors (six to be exact) such as height and angle of the lift, frequency of the lift, type of hand grip, and travel distance; these are all as important in assessing a lift as the weight of the object. These “Multipliers” are used in the equation to account for the specific workplace/lifting variables—these reduce the Recommended Weight Limit (RWL), which is one of the main products of the NIOSH formula.

The RWL is used along with a Lifting Index (LI) to come up with a rating for the lift. The goal is to get the LI as close to 1.0 as possible—the greater the LI is above 1.0, the more dangerous the lift becomes. (For example, a lift with an LI of 2.0 might be considered relatively safe, but is not ideal. Therefore, the employer should work to change the variables in the lift to bring the LI closer to 1.0.)

To use the Equation, safety professionals must make actual measurements of the specific lift (e.g., distances, durations), then find those numbers in the corresponding tables/charts in the Equation’s Application Manual; the value from the table can then be inserted into the formula.

***Note:** The NIOSH Lifting Equation is not suitable for one-handed lifts, or for unstable loads.* For detailed guidance on using the NIOSH Lifting Equation, go to the web address below.

<http://www.cdc.gov/niosh/docs/94-110/pdfs/94-110.pdf>

