

NIOSH Lifting Equation (revised)

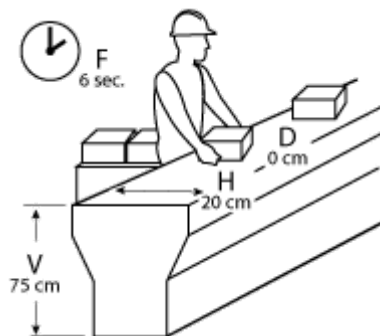
NIOSH Lifting Equation - Frequency Factor

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How can the frequency factor affect the weight limit?

Example: A worker lifts 10 kg boxes from the conveyor to the cart ten times every minute for two-hours.



To calculate the recommended weight limit (RWL) for the task:

- Determine the weight of the load.

Weight equals 10 kg

- Assess the six components of the lifting task. Refer to [Assessing Relevant Handling Factors](#) for more information.

H (Horizontal Distance)- 20 cm

V (Vertical Distance) - 75 cm

D (Lifting/ carrying Distance) - 0 cm

F (Frequency) - 6 sec over 1 hour, standing

A (Angle) - 90°

C (Coupling/quality of grip) - fair, standing

- Select the appropriate multiplier factors for each component of lifting from the tables in [Assessing Relevant Handling Factors](#).
- Determine the Recommended Weight Limit for the task. Refer to [Assessing Relevant Handling Factors](#) and [Calculating Recommended Weight Limit \(RWL\)](#).

The revised NIOSH Lifting Equation is: $23 \text{ kg} \times \text{HM} \times \text{VM} \times \text{DM} \times \text{AM} \times \text{FM} \times \text{CM} = \text{RWL}$

$23 \text{ kg} \times 1.00 \times 0.93 \times 1.00 \times 0.71 \times 0.13 \times 1.00 = 1.97 \text{ kg}$

* In this example, the vertical distance is 75 cm. From the tables, the vertical multiplier (VN) was greater than 70 cm (value of 0.99), so the value of 0.93 was selected (lifting distance of 70 cm) to be more protective.

- Compare weight of the load against the calculated Recommended Weight Limit for the task. The weight of 10 kg is much larger than the recommended weight limit of 1.97 kg.

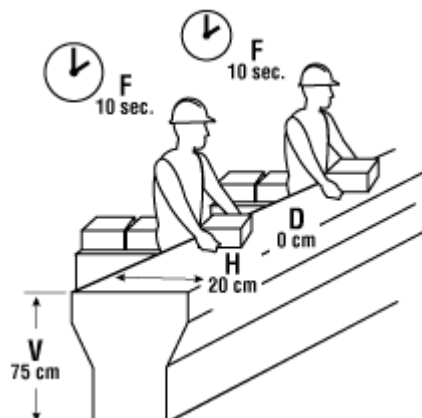
Conclusion

The weight of the load is 10 kg, which is higher than the calculated recommended weight limit of 1.97 kg.

Therefore, this task is likely to increase the risk of a lifting related injury.

Recommendations

- Assess which of components contribute more to the risk. Refer to [Assessing Relevant Handling Factors](#).
 - the critical factor is FM for the frequency of lifting and duration of task.
- Shorten the frequency of lifting by:
 - reducing the frequency of incoming boxes in half, or
 - assigning additional workers to the task, or
 - shorten the time of the task to 1 hour.



Evaluate the Redesigned Task:

- Assess the six components of the task in redesigned task.
- Determine new Weight Limit. Refer to [Assessing Relevant Handling Factors](#) and [Calculating Recommended Weight Limit \(RWL\)](#).

The revised NIOSH Lifting Equation is: $23 \text{ kg} \times \text{HM} \times \text{VM} \times \text{DM} \times \text{AM} \times \text{FM} \times \text{CM} = \text{RWL}$

$23 \text{ kg} \times 1.00 \times 0.93 \times 1.00 \times 0.71 \times 0.75 \times 1.00 = 9.90 \text{ kg}$

* In this example, the vertical distance is 75 cm. From the tables, the vertical multiplier (VN) was greater than 70 cm (value of 0.99), so the value of 0.93 was selected (lifting distance of 70 cm) to be more protective.

- Compare weight of the box against Recommended Weight Limit for redesigned task.

The weight of the load at 10 kg is now similar to the calculated weight limit of 9.90 kg.

Further improvement can be achieved by reducing the weight of the object.

Therefore, while most workers can likely safely perform the task, the work should be monitored for the development of injuries.

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