

A Step-by-Step Guide to the SNOOK Tables

The Liberty Mutual MMH Tables (commonly known as the “Snook Tables”) is an ergonomic assessment tool in the public domain based on research by Dr. Stover Snook and Dr. Vincent Ciriello at the Liberty Mutual Research Institute for Safety.

You can view the original source materials here:

Source: [Liberty Mutual Manual Material Handling Tables](#)

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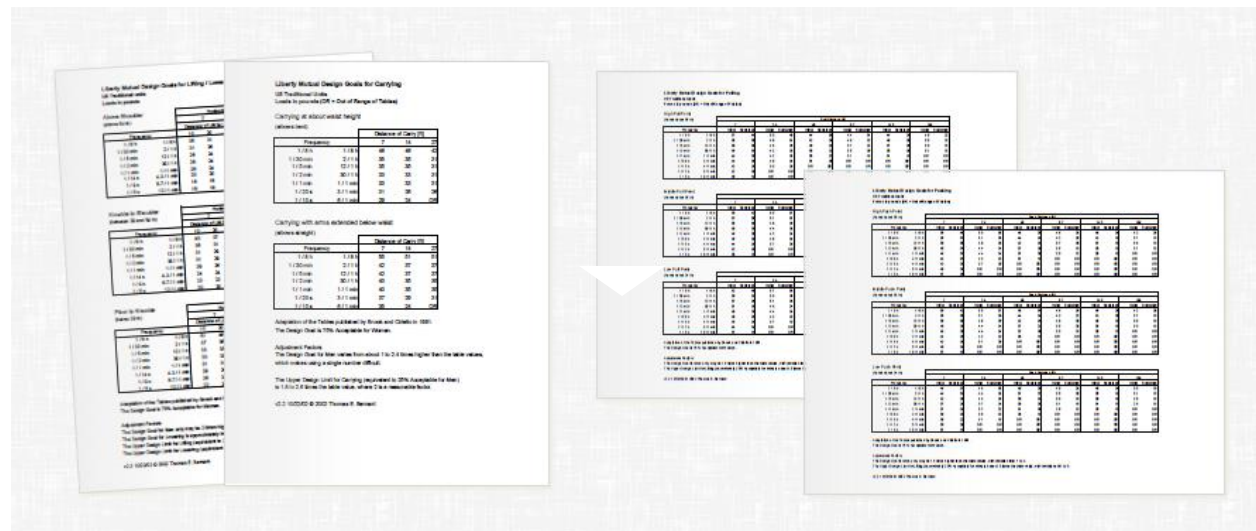
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SNOOK TABLES

Introduction

The Liberty Mutual MMH Tables (commonly known as “Snook Tables”) outline maximum acceptable weights and forces for design of manual handling tasks, based on research by Dr. Stover Snook and Dr. Vincent Ciriello at the Liberty Mutual Research Institute for Safety. The tables provide weight/force values, for specific types of job tasks that are deemed to be acceptable to a defined percentage of the population. This is done by comparing data for each of the specific manual handling tasks against the appropriate table. Link to tables provided above.

The tables have been adapted by Thomas E. Bernard (University of South Florida) with some support from the OSHA Salt Lake Technical Center. This adaptation yields a design goal output for various lifting, lowering, pushing, pulling, and carrying tasks. The Ergonomics Plus Snook Tables Excel Calculator is based on Bernard’s adapted tables.



Notes from Thomas E. Bernard on reported values: For design goals, 75% acceptable for women was selected as the appropriate target. In some cases, multipliers (adjustment factors) are provided to adjust to 75% acceptable for males and to an upper limit representing 25% acceptable for men. The format and some content of the tables have been changed from the original. There was also a harmonization of frequencies in the carry, push, and pull tables that required some judgment of what the value should be. In

the carry, push and pull tables, OR (out of range) is used for some combinations of frequency and distance that were not in the reported range of results.

Guidelines for using the Snook Tables

When the task specific data does not match the values in the table, select the next highest table value that is closest to the actual task requirements. By selecting the next highest value in the table for any of the specific criteria, a more conservative or protective assessment will result.

Many jobs require a wide variety of manual handling tasks (lifting, lowering, pushing, pulling, and/or carrying) which can be assessed as a whole using the Snook Tables. This can be done by comparing data for each of the specific manual handling tasks against the appropriate table, and then using the 'total frequency for all the tasks' as the frequency value to determine the percentage of the population that would find the task to be acceptable.

For example, if a job requires lifting at a rate of one lift every two minutes, a push every five minutes and a carry every five minutes, the worker would do four and a half 'tasks' over five minutes, or approximately one task per minute. The evaluator can then compare the data for the lift, carry and push, against the appropriate table but use the same frequency (one per minute) for each to determine a result.

When a mixture of males and females are doing the task, the task should be designed so that it is acceptable to at least 75% of the female population, which would make it acceptable to more than 90% of the male population. Any task that cannot be performed by at least 75% of the total population should be considered for MSD prevention controls and redesign.

Getting Ready

The evaluator should prepare for the assessment by interviewing and observing workers to gain a complete understanding of the job tasks and demands. Selection of the job tasks to be evaluated should be based on the most difficult manual material handling work tasks, based on worker interview and job observation. Equipment needed: A tape measure is required to take distance measures, and a weigh scale or force measurement gauge is required to determine the weight of the object(s) being lifted/lowered or carried, and the forces required for pushing and pulling.

Data Collection

For each job task analyzed, the evaluator will need to collect relevant data.

Measurements and data required for this method include:

Weight: the weight of the object being lifted, lowered, or carried.

Lift/lower distance: the distance of travel of the hands while lift or lower taking place.

Hand distance: the distance from the front of the body to the hands. This will normally be half the width of the object being handled unless the object is purposely held away from the body.

Hand height: the height of the hands on the object being pushed or pulled, or the height of the hands when carrying a load.

Push/pull/carry distance: the distance the item is pushed or pulled, or carried.

Frequency: the number of lifts, lowers, pushes, pulls or carries expressed in terms of number of activities done in 'x' seconds, minutes, or hours (see tables).

Force requirement: For each pushing and pulling task evaluated, you will need to measure the amount of force required to get the item moving (initial force) and then measure the amount of force it takes to keep the item moving (sustained force).

Lift/lower zone: the area of the body in which the lift/lower finishes. Take note of the position of the hands when the worker has completed the lift/lower (floor to knuckle, knuckle to shoulders, or shoulder to overhead reach)

USING THE SNOOK TABLES – EXAMPLES

Example 1: Above Shoulder Lift

Variables determined by the assessment:

- **Vertical Location** - above shoulder lift (54"+)
- **Frequency** - average of 1 lift every 5 minutes
- **Horizontal Distance** – 10" (front of body to mid-line of hands)
- **Distance of Lift** – 30" (lifts from cart at 25" to rack height of 55")



Enter the data into the Snook Tables calculator:

Above Shoulder (above 54 in)	
	Enter Data
Frequency	1 lift every 5 minutes
Horizontal Distance (in)	10
Distance of Lift (in)	30
Design Goal	18

Design goal = 18 pounds

Example 2: Floor to Knuckle Lift

Variables determined by the assessment:

- **Vertical Location** – floor to knuckle lift (below 29")
- **Frequency** - average of 1 lift every 2 minutes
- **Horizontal Distance** – 10" (front of body to mid-line of hands)
- **Distance of Lift** – 30" (lowers from height of 32" to 4"= 28", rounded to value of 30)



Enter the data into the Snook Tables calculator:

Floor to Knuckle (below 29 in)	
	Enter Data
Frequency	1 lift every 2 minutes
Horizontal Distance (in)	10
Distance of Lift (in)	30
Design Goal	22

Design goal = 22 pounds

Example 3: Carrying

Variables determined by the assessment:

- **Vertical Location** – Carrying at about waist height with elbows bent
- **Frequency** - average of 1 carry every 2 minutes
- **Distance of Carry** – up to 40' (use highest value of 27')



Carrying at About Waist Height (elbows bent)	
	Enter Data:
Frequency	1 carry every 2 minutes
Distance of Carry (ft)	27
Design Goal (lbs)	31

Design goal = 31 pounds

Example 4: Pulling

Variables determined by the assessment:

- **Vertical Location** – Middle pull point
- **Frequency** – 1 pull every 10 minutes (round down to 1/5 minutes)
- **Distance of Pull** – up to 75' (use value of 97')



Middle Pull Point

(hands about 36 inches)

	Enter Data:
Frequency	1 pull every 5 minutes
Pull Distance	97
Initial	40
Sustained	20

Design goal = Initial 40 pounds, Sustained 20 pounds



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