

WORKSHEET B

MSI Risk Factor Assessment

Job Title or Task: _____ Date: _____

Completed By: _____

Section 4.48 in the Ergonomics (MSI) Requirements requires the employer to assess those factors that expose workers to a risk of MSI. This document can be used to determine if the risks identified in the document titled *Worksheet A - MSI Risk Factor Identification* pose a high or moderate risk.

Instructions:

- Document** the job title or task, date and name of persons completing the worksheet. Risk assessment should be performed by someone who understands the work process, the MSI risk factors, and the principles of risk assessment and control.
- Complete** the Risk Factor Summary Table using the results from *Worksheet A – Risk Factor Identification*. These risk factors are considered to pose at least a moderate risk of MSI.
- Perform** Risk Factor Assessment only on those factors identified from Worksheet A.
- Observe and consult** with a representative sample of workers and those workers with signs & symptoms of MSI.
- Read** across the page under each risk factor and determine if all of the criteria in that row are present in the work activities.
 - Explanatory notes regarding duration and exposure pattern under Instructions in Worksheet A also apply to Worksheet B.
- Check** the box to indicate that a high risk of MSI exists if all criteria are present.
 - Make any appropriate notes to clarify specific details.
- Complete** the High Risk column of the Risk Factor Summary Table.



Interpretation of Results

Section 4.50(1) in the Ergonomics (MSI) Requirements requires the employer to eliminate, or if that is not practicable, minimize the risk of MSI to workers. Worksheets A and B can be used to prioritize tasks based on their risk levels. Employers should eliminate or minimize higher risk tasks first.

Risk Factor Summary Table

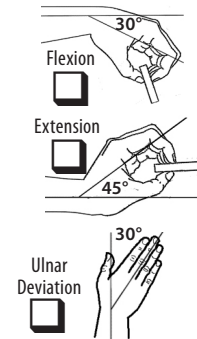

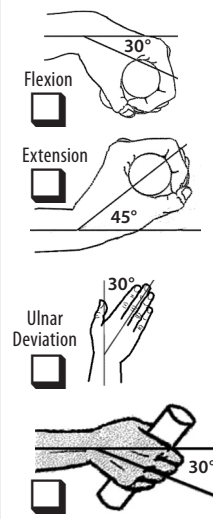
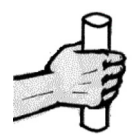
RISK FACTOR	MODERATE RISK Risk Factors Identified from Worksheet A	HIGH RISK Risk Factors Indicated on Worksheet B
Contact Stress	<input type="checkbox"/>	<input type="checkbox"/>
Repetition	<input type="checkbox"/>	<input type="checkbox"/>
Grip Force	<input type="checkbox"/>	<input type="checkbox"/>
Lift/Lower Force	<input type="checkbox"/>	<input type="checkbox"/>
Awkward Posture	<input type="checkbox"/>	<input type="checkbox"/>
Vibration	<input type="checkbox"/>	<input type="checkbox"/>

CONTACT STRESS

CONTACT STRESS				Check the box <input checked="" type="checkbox"/> to indicate High Risk of MSI
Body Part	Physical Risk Factor	Duration	Visual Aid	
HANDS	Using the hand (heel/base of palm) as a hammer more than once per minute	More than 2 hours total per day		<input type="checkbox"/>
KNEES	Using the knee as a hammer more than once per minute	More than 2 hours total per day		<input type="checkbox"/>

REPETITION

REPETITION				Check the box <input checked="" type="checkbox"/> to indicate High Risk of MSI
Body Part	Physical Risk Factor	Combined with	Duration	
NECK SHOULDERS ELBOWS WRISTS HANDS	Using the same motion with little or no variation every few seconds (exclude typing)	No other risk factors	More than 6 hours total per day	<input type="checkbox"/> NECK <input type="checkbox"/> SHOULDERS <input type="checkbox"/> ELBOWS <input type="checkbox"/> WRISTS <input type="checkbox"/> FINGERS
WRISTS	Using the same motion with little or no variation every few seconds (excluding typing)	Wrists bent in $\geq 30^\circ$ flexion, or $\geq 45^\circ$ extension, or $\geq 30^\circ$ ulnar deviation, AND High forceful hand(s) exertions	More than 2 hours total per day	<input type="checkbox"/>
HANDS	Intensive typing	Awkward wrist posture $\geq 30^\circ$ flexion, or $\geq 45^\circ$ extension, or $\geq 30^\circ$ ulnar deviation	More than 4 hours total per day	<input type="checkbox"/>
	Typing with the hands or fingers in a rapid, steady motion with few opportunities for temporary work pauses.	No other risk factors	More than 7 hours total per day	<input type="checkbox"/>

GRIP FORCE					Check the box <input type="checkbox"/> to indicate High Risk of MSI
Body Part	Physical Risk Factor	Combined with	Duration	Visual Aid	
ARMS WRISTS HANDS	Pinch gripping an unsupported object(s) <ul style="list-style-type: none"> Weighing 1 kg (2 lb.) or more per hand, OR <ul style="list-style-type: none"> Pinch gripping with a force of 2 kg (4 lb.) or more per hand (comparable to pinch gripping half a stack of photo-copy paper) 	Highly repetitive motion	> 3 hours total per day		<input type="checkbox"/>
		Wrists bent in $\geq 30^\circ$ flexion, or $\geq 45^\circ$ extension, or $\geq 30^\circ$ ulnar deviation	More than 3 hours total per day		<input type="checkbox"/>
		No other risk factors	More than 4 hours total per day		<input type="checkbox"/>
		Highly repetitive motion	> 3 hours total per day		<input type="checkbox"/>
ARMS WRISTS HANDS	Power gripping an unsupported object(s) <ul style="list-style-type: none"> Weighing 5 kg (10 lb.) or more per hand OR <ul style="list-style-type: none"> Power gripping with a force of 5 kg (10 lb.) or more per hand (comparable to clamping light duty automotive jumper cables onto a battery) 	Wrists bent in $\geq 30^\circ$ flexion, or $\geq 45^\circ$ extension, or $\geq 30^\circ$ ulnar deviation	More than 3 hours total per day		<input type="checkbox"/>
		No other risk factors	More than 4 hours total per day		<input type="checkbox"/>
		Highly repetitive motion	> 3 hours total per day		<input type="checkbox"/>
		Highly repetitive motion	> 3 hours total per day		<input type="checkbox"/>

Note: A pinch grip occurs when the force application is primarily between the fingers and thumb.
A power grip occurs when the force is primarily between the fingers and the palm.

LIFT/LOWER RISK ASSESSMENT – To Determine High Risk

This document can be used to assess forceful exertion due to lifting/ lowering force. WorkSafeBC's On-line Lift/Lower Calculator can also be used to assess lifting/lowering.

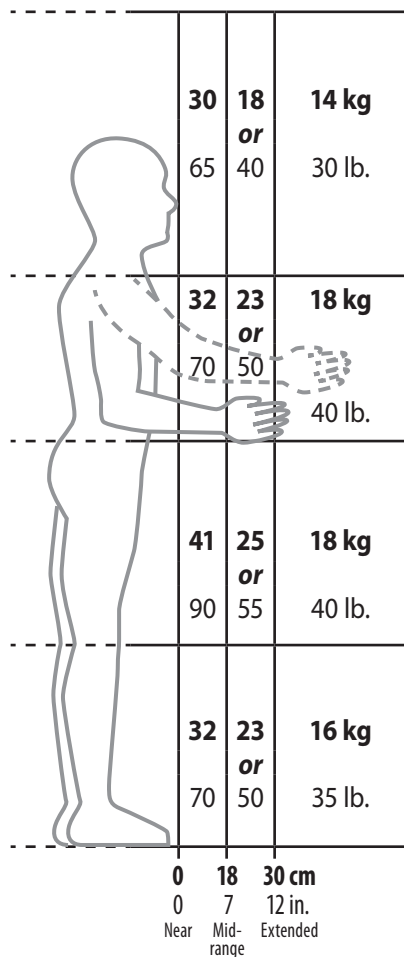
If a job involves a number of lifts with different weights and/or different postures, use Steps 1-5 to:

1. Assess the two worst case lifts—the **heaviest object** lifted and the lift in the **most awkward posture**, and
2. The **most commonly performed** lift. In Step 3, use the frequency and duration for all of the lifting done in a typical workday.

Step 1 Find the actual weight of the object that the employee lifts.

Actual Weight = _____

Step 2 Determine the Unadjusted Weight Limit. Determine the most awkward hand position during the lift/ lower task. Mark that spot on the diagram below. The number in that box is the Unadjusted Weight Limit.



Unadjusted Weight Limit = _____

Step 3 Find the Limit Reduction Modifier. Find out how many times the employee lifts per minute and the total number of hours per day spent lifting. Use this information to look up the Limit Reduction Modifier in the table below.

How Many Lifts per Minute?	For How Many Hours per Day?		
	1 hr or less	1 hr to 2 hrs	2 hrs or more
1 lift every 2-5 min.	1.0	0.95	0.85
1 lift every min.	0.95	0.9	0.75
2-3 lifts every min.	0.9	0.85	0.65
4-5 lifts every min.	0.85	0.7	0.45
6-7 lifts every min.	0.75	0.5	0.25
8-9 lifts every min.	0.6	0.35	0.15
10+ lifts every min.	0.3	0.2	0.0

Note: For lifting performed less than once every five minutes, use 1.0

Limit Reduction Modifier: _____

Step 4 Determine the Twisting Adjustment. If the employee twists more than 45 degrees while lifting, the Twisting Adjustment is 0.85. Otherwise, use 1.0

Twisting Adjustment: = _____

Step 5 Calculate the Weight Limit. Start by copying the Unadjusted Weight Limit from Step 2. Multiply the Unadjusted Weight Limit by the Limit Reduction Modifier from Step 3 and the Twisting Adjustment from Step 4 to get the Weight Limit.



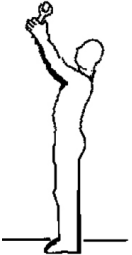
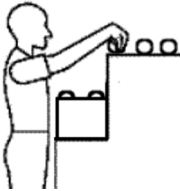

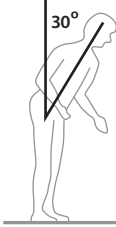
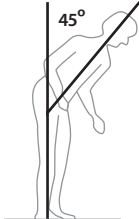
$$\frac{\text{Step 2}}{\text{Step 2}} \times \frac{\text{Step 3}}{\text{Step 3}} \times \frac{\text{Step 4}}{\text{Step 4}} = \frac{\text{Weight Limit}}{\text{Weight Limit}}$$

Actual Weight = _____ Weight Limit: = _____

Is this a hazard? Compare the Actual Weight lifted from Step 1 to the calculated Weight Limit in Step 4. If the **Actual Weight** (Step 1) > the **Weight Limit** (Step 4), then the lift is high risk. If the Actual Weight is below the Weight Limit, the risk is moderate.

AWKWARD POSTURE

Check the box
 to indicate
 High Risk of
 MSI

Body Part	Physical Risk Factor	Duration	Visual Aid	Check the box <input checked="" type="checkbox"/> to indicate High Risk of MSI
KNEES	Squatting	More than 4 hours total per day		<input type="checkbox"/>
	Kneeling	More than 4 hours total per day		<input type="checkbox"/>
SHOULDERS	Working with the hand(s) above the head or the elbow(s) above the shoulder(s)	More than 4 hours total per day		<input type="checkbox"/>
	Repetitively raising the hand(s) above the head or the elbow(s) above the shoulder(s) more than once per minute	More than 4 hours total per day		<input type="checkbox"/>
NECK	Working with the neck bent more than 45° (without support or the ability to vary posture)	More than 4 hours total per day		<input type="checkbox"/>
BACK	Working with the back bent forward more than 30° (without support, or the ability to vary posture)	More than 4 hours total per day		<input type="checkbox"/>
	Working with the back bent forward more than 45° (without support or the ability to vary posture)	More than 2 hours total per day		<input type="checkbox"/>

VIBRATION RISK ASSESSMENT – To Determine High Risk

Use this document to determine if a high risk of MSI from hand-arm vibration exists.

Step 1 Find the vibration value for the tool through one of the following methods:

- Get it from the manufacturer
- Look it up at www.vibration.db.umu.se/Default.aspx?lang=en
- Measure the vibration yourself: follow ISO Standard 5349-1:2001 and ISO Standard 5349-2:2001

The vibration value is the dominant frequency-weighted root-mean-square component acceleration and is expressed in metres per second squared (m/s^2).

Step 2 Determine how many hours per day the worker uses the tool (i.e., the amount of time that the tool is actually vibrating in the worker's hands). This is the total exposure time (see the left-hand column in the table below).

Step 3 The right-hand column of the table shows the vibration value that will protect nearly all workers for a given daily exposure time.

Total daily exposure time	Maximum vibration value considered safe for nearly all workers
4 to less than 8 hours	4 m/s^2
2 to less than 4 hours	6 m/s^2
1 to less than 2 hours	8 m/s^2
Less than 1 hour	12 m/s^2

Note: This table is adapted from [OHS Guideline G7.11-1](#).