

## CASE STUDY - Packing

### TASK TITLE: Packing

<b>Task Description:</b>	<p>Packing involves lifting the product and placing it into a container. Once it is placed into the container the individual manually pulls the edges of the fabric together to produce a complete package. Cords are manually pulled through the holds of the outer fabric to tighten and size piece. The packing pattern must be followed for each type of product (patterns outlined in product manual). Most packing patterns are performed by two individuals due to the size of the product and the force required to pack the work piece.</p> <p>Typical jobs in which folding is performed include (not necessarily limited to):</p> <ul style="list-style-type: none"><li>• Parachute packing</li><li>• Raft packing</li></ul> <p>The packing process can be performed on a table or on the floor surface.</p>
<b>Job Performance Measures Most Often Impacted by Packing:</b>	<p>Quality of the product (packing). Speed of packing</p>
<b>Typical Employee Comments about Packing:</b>	<p>Employees typically complain about discomfort and/or stiffness in the hands/wrists/arms, back and legs/feet.</p> <p>Primary concern: back/torso and legs/feet Secondary concern: hands/wrists/arms</p>
<b>Suggested Level II Analysis:</b>	<p>Dynamic task analysis, Postural Analysis, Grip Force Measurement</p>

## Shoulder/Neck

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
1. Reaching	<ul style="list-style-type: none"> <li>Work location is too high (see Figure 1.1)</li> </ul>  <p style="text-align: center;"><b>Figure 1.1</b></p> <ul style="list-style-type: none"> <li>Work location is too far away</li> </ul>	123. Raise the person <ul style="list-style-type: none"> <li>use a step stool, platform or ladder</li> </ul>	✓	✓	low to med	med	med
		32. Lower work piece		✓	med	med	med
		38. Move closer to the work location <ul style="list-style-type: none"> <li>remove obstruction</li> </ul>	✓	low	med	med	
		41. Move work piece closer to body	✓		low	med	med

## Shoulder/Neck (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
2. Arm forces: Repeated contraction of the muscles of the arm or holding/carrying materials	Pulling cords or container is difficult (see Figure 1.2)  <b>Figure 1.2</b> <ul style="list-style-type: none"> <li>• Poor hand holds</li> <li>• Poor housekeeping</li> <li>• Poor floor condition</li> <li>• Carrying folded packed work piece more than three steps</li> </ul>	55. Provide a hook-type tool to pull items <ul style="list-style-type: none"> <li>• provide curved hook to assist pulling cord.</li> </ul>	✓	✓	low to med	med	med
		26. Improve floor condition <ul style="list-style-type: none"> <li>• repair cracks or gaps in floor and</li> <li>• provide ramps to compensate for minor differences in floor height</li> <li>• Improve housekeeping</li> </ul>	✓	✓ ✓	med to high med to high low	med med med	med med med
		48. Provide a cart <ul style="list-style-type: none"> <li>• provide trolley to move work piece</li> </ul>		✓	med	med	med
		61. Provide a mechanical lift device		✓	med	med	med

## Shoulder/Neck (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
4. Head/neck bent or twisted	<ul style="list-style-type: none"> <li>Work location is too low (see Figure 1.3)</li> </ul>	124. Raise the work piece/work surface		✓	med	med	med
	 <p><b>Figure 1.3</b></p>	<ul style="list-style-type: none"> <li>provide a fixed table to support work piece</li> </ul>					
	<ul style="list-style-type: none"> <li>Work location is too high</li> </ul>	13. Encourage ergonomic work techniques	✓		low	med	med
		<ul style="list-style-type: none"> <li>educate person to work in a kneeling position when item is located on floor surface (provide knee protection).</li> </ul>					
		123. Raise the person		✓	med	med	med
		<ul style="list-style-type: none"> <li>provide fixed height platform</li> </ul>					

## Hands/Wrists/Arms

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
5. Bent wrists/repeated wrist movements or repeated forearm rotation	<ul style="list-style-type: none"> <li>Work location is blocked or is in an inappropriate orientation</li> <li>Work location is too high</li> </ul>	136. Rotate the work piece <ul style="list-style-type: none"> <li>rotate the work piece manually</li> </ul>	✓		low	med	med
		123. Raise the person <ul style="list-style-type: none"> <li>use a fixed platform</li> </ul>		✓	med	med	med
6. Repeated manipulations with fingers	<ul style="list-style-type: none"> <li>Task is repetitive in nature requiring similar movement patterns.</li> </ul>	20. Incorporate rest pauses	✓		low	med	med
7. Hyper-extension of finger/thumb or repeated single finger activation	<ul style="list-style-type: none"> <li>Rarely occurs</li> </ul>	N/A					
8. Hand/grip forces	<ul style="list-style-type: none"> <li>Excessive force required to tighten cord and pack</li> </ul>	13. Encourage ergonomic work techniques <ul style="list-style-type: none"> <li>twist cord around T-hook to assist with pulling cords.</li> <li>use knee rather than hand to push down on pack when item is located on floor surface.</li> </ul>	✓		low	med	med
			✓		low	med	med

### Hands/Wrists/Arms (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
	<ul style="list-style-type: none"> <li>Small diameter of the cord</li> </ul>	3. Change a pinch grip to a power grip <ul style="list-style-type: none"> <li>twist cord around a small rod to change the grip from a pinch to a power grip.</li> </ul>	✓		low	med	med
9. High speed hand/wrist/arm movement or vibration, impact, or torque to the hand	<ul style="list-style-type: none"> <li>Rarely occurs</li> </ul>	N/A					
10. Exposure to hard edges	<ul style="list-style-type: none"> <li>Work station has hard or sharp material edges</li> </ul>	9. Eliminate exposure to hard edges <ul style="list-style-type: none"> <li>provide padding for edges</li> <li>round off exposed edges</li> </ul>	✓	✓	low med	med med	med med
11. Hands and fingers exposed to cold temperatures	<ul style="list-style-type: none"> <li>Rarely occurs</li> </ul>	N/A					

## Back/Torso

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
12. Repeated forward or sideways bending movements	<ul style="list-style-type: none"> <li>Work Location is too low (see Figure 1.4)</li> </ul>  <p style="text-align: center;"><b>Figure 1.4</b></p>	124. Raise the work piece/work surface <ul style="list-style-type: none"> <li>provide a fixed table to support work piece</li> <li>provide and adjustable table for work piece</li> </ul>		✓  ✓	med  high	med  med	med  high
13. Twisting of the lower back	<ul style="list-style-type: none"> <li>Work location is blocked or is in an inappropriate orientation</li> </ul>	136. Rotate the work piece <ul style="list-style-type: none"> <li>turn the work piece manually</li> </ul> 132. Remove obstructions	✓  ✓		low  low	med  med	med  med
14. High speed, sudden movements	<ul style="list-style-type: none"> <li>Rarely occurs</li> </ul>	N/A					
15. Static, awkward back postures	<ul style="list-style-type: none"> <li>Rarely occurs</li> </ul>	N/A					

**Back/Torso (cont'd)**

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
16. Lifting forces	Lifting heavy packed objects <ul style="list-style-type: none"> <li>• low height</li> <li>• no hand holds</li> </ul>	61. Provide a mechanical lift device <ul style="list-style-type: none"> <li>• provide lifting hoist to move raft or work piece</li> </ul>		✓	high	med	high
		13. Encourage ergonomic work techniques <ul style="list-style-type: none"> <li>• educate person on two man lift procedure</li> </ul>	✓	low	med	med	
17. Pushing or pulling	Pulling/pushing storage containers is difficult <ul style="list-style-type: none"> <li>• Poor housekeeping</li> <li>• Poor floor condition</li> <li>• Lack of wheels on container</li> </ul>	17. Improve floor condition <ul style="list-style-type: none"> <li>• repair cracks or gaps in floor</li> <li>• provide ramps to compensate for minor differences in floor height</li> <li>• improve housekeeping</li> </ul>	✓	✓	high low	med med	med med
		13. Encourage ergonomic work techniques <ul style="list-style-type: none"> <li>• position packing container so that it does not have to be moved after loading</li> </ul>	✓		low	med	med
		119. Provide wheels <ul style="list-style-type: none"> <li>• mount wheels onto bottom of container</li> </ul>		✓	med	med	med
18. Whole body vibration	<ul style="list-style-type: none"> <li>• Rarely occurs</li> </ul>	N/A					

## Legs/Feet

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
19. Fixed position, standing	<ul style="list-style-type: none"> <li>Standing on hard surface (see Figure 1.5)</li> </ul>  <p style="text-align: center;"><b>Figure 1.5</b></p>	96. Provide appropriate shoe inserts  86. Provide an appropriate anti-fatigue mat	✓	✓	low  med	med  med	med  med
20. Exposure to hard edges on legs, knees, and feet	<ul style="list-style-type: none"> <li>Rarely occurs</li> </ul>	N/A					
21. Awkward leg postures	<ul style="list-style-type: none"> <li>Work height too low (see Figure 1.6)</li> </ul>  <p style="text-align: center;"><b>Figure 1.6</b></p>	1. Alternate between sitting and standing tasks <ul style="list-style-type: none"> <li>periodically stand up to change position.</li> </ul> 95. Provide appropriate knee protection	✓		low  med	med  med	med  med

## Head/Eyes

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
22. Standing foot pedal	<ul style="list-style-type: none"> <li>Rarely occurs</li> </ul>	N/A					
23. Difficult to see/light levels too low/too high	<ul style="list-style-type: none"> <li>Rarely occurs</li> </ul>	N/A					
24. Intensive visual tasks, staring at work objects for long periods	<ul style="list-style-type: none"> <li>Rarely occurs</li> </ul>	N/A					