

CASE STUDY - Stripping/de-painting by hand

TASK TITLE: Stripping/de-painting by hand

Task Description:	Stripping/de-painting by hand is a process where a solvent is applied to a surface order to remove the finish on that surface. The individual doing this task may use either brushes or rags to apply the solvent. Many times the process appears to involve wiping down a surface (e.g., wood or metal) with a liquid. The process may be done by placing the piece on a work bench or the individual may stand/sit/kneel on or near the structure (e.g., aircraft).
Job Performance Measures Most Often Impacted by Stripping/de-painting by Hand:	Amount of material removed in a time period. Quality of surface (consistency, free of mars)
Typical Employee Comments about Stripping/de-painting by Hand:	Employees typically complain about discomfort and/or stiffness in the shoulders/neck, hands/wrists, back and legs. The primary body parts affected are typically: hands/wrists/arms and shoulders/neck. The secondary body parts affected are typically: back/torso and legs/feet.
Suggested Level II Analysis:	Postural Task Analysis, Elemental Task Analysis

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"> • Work location too high • The concentration of solvent is not strong enough for the amount of material to be removed 	123. Raise the person					
		<ul style="list-style-type: none"> • provide a step stool • provide an adjustable platform 	✓	✓ ✓	med high	med med	med high
		32. Lower the work piece/ work surface	✓	✓	med	med	med
		117. Provide support for the upper body					
		<ul style="list-style-type: none"> • rest arms on near-by surfaces • provide flexible arm rests 	✓	✓	low med	med med	med med
		90. Provide an auxiliary table					
		<ul style="list-style-type: none"> • provide a fixture or jig to allow the work to be repositioned 		✓	med	med	med
		97. Provide appropriate solvent solution		✓	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
	<ul style="list-style-type: none"> Work location is too far away 	38. Move closer to the work location <ul style="list-style-type: none"> modify work platform to position employee closer to work 132. Remove obstructions	✓	✓	med	med	high
			✓		low	med	med
2. Arm forces: Repeated contraction of the muscles of the arm or holding/ carrying materials	<ul style="list-style-type: none"> The concentration of solvent being used is not strong enough for the amount material to be removed 	97. Provide appropriate solvent solution		✓	med	med	med
	<ul style="list-style-type: none"> The method used is not appropriate for the amount of material to be removed. 	66. Provide a power tool <ul style="list-style-type: none"> evaluate the possibility of mechanical stripping 		✓	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	
3. High speed, sudden shoulder movements	<ul style="list-style-type: none"> Rarely occurs 	N/A						
4. Head/neck bent or twisted	<ul style="list-style-type: none"> Work location too high (see Figure 1.1)  <p>Figure 1.1</p> <ul style="list-style-type: none"> Finish quality must be visually inspected <ul style="list-style-type: none"> Work location is too low 	123. Raise the person <ul style="list-style-type: none"> provide a step stool provide an adjustable platform 	✓	✓ ✓	med high	med med	med high	
		32. Lower the work piece/work surface	✓	✓	med	med	med	
		22. Increase light levels	✓		med	med	med	
		<ul style="list-style-type: none"> provide task lighting which is easy to adjust provide task lighting that allows for at least 75fc foot-candles (750 lux) 	✓		med	med	med	
		31. Lower the person	✓	✓	med	med	med	
<ul style="list-style-type: none"> provide a stool 		✓	med	med	med			
124. Raise the work piece				✓	med	med	med	

Hand/Wrist/Arm

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"> The type of tool used is not appropriate for the amount of material to be removed. Work surface is too high or too far away 	66. Provide a power tool		✓	med	med	med
		123. Raise the person <ul style="list-style-type: none"> provide a step stool provide an adjustable platform 	✓	✓ ✓	med high	med med	med high
		32. Lower the work piece/work surface	✓	✓	med	med	med
		136. Rotate the work piece <ul style="list-style-type: none"> rotate the piece manually provide a fixture to allow the work piece to be rotated 	✓	✓	low med	med med	med med
6. Repeated manipulations with fingers	<ul style="list-style-type: none"> Rarely occurs 	N/A					
7. Hypertension of finger/thumb or repeated single finger activation	<ul style="list-style-type: none"> Rarely occurs 	N/A					

Hand/Wrist/Arm (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
8. Hand/grip forces	<ul style="list-style-type: none"> The type of tool used is not appropriate for the amount of material to be removed. The concentration of solvent being used is not strong enough for the amount of material to be removed 	66. Provide a power tool		✓	med	med	med
		97. Provide appropriate solvent solution	✓	✓	med	med	med
9. High speed hand/wrist/arm movements or vibration, impact, or torque to the hand	<ul style="list-style-type: none"> Rarely occurs 	N/A					
10. Exposure to hard edges	<ul style="list-style-type: none"> Rarely occurs 	N/A					
11. Hands and fingers exposed to cold temperatures	<ul style="list-style-type: none"> Rarely occurs 	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"> Work surface is too high or too far away 	123. Raise the person <ul style="list-style-type: none"> Provide a step stool provide an adjustable platform (see Figure 1.2)  <p style="text-align: center;">Figure 1.2</p>	✓	✓ ✓	med high	med med	med high
		32. Lower the work piece/work surface	✓	med	med	med	
13. Twisting of the lower back	<ul style="list-style-type: none"> The type of tool used is not appropriate for the amount of material to be removed. (see Figure 1.3)  <p style="text-align: center;">Figure 1.3</p>	66. Provide a power tool <ul style="list-style-type: none"> evaluate the feasibility of mechanical stripping. 		✓	med	med	med

Back/Torso (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"> • Work surface is in an awkward orientation • Work space is cramped or access is limited 	136. Rotate the work piece <ul style="list-style-type: none"> • rotate the piece manually • provide a fixture to allow the work piece to be rotated 63. Provide a padded, compressible surface to lay on to get closer to the work 117. Provide support for the upper body <ul style="list-style-type: none"> • provide a mobile stool with a back rest to support the upper body 	✓	✓	low med	med med	med med
			✓		low	med	med
				✓	med	med	med
14. High speed, sudden movements	<ul style="list-style-type: none"> • Rarely occurs 	N/A					
15. Static, awkward postures	<ul style="list-style-type: none"> • Work space is cramped or access is limited 	63. Provide a padded, compressible surface to lay on 117. Provide support for the upper body <ul style="list-style-type: none"> • provide a mobile stool with a back rest to support the upper body 	✓	✓	low med	med med	med med

Back/Torso (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"> Work surface is too far away 	132. Remove obstructions 124. Raise the work piece/work surface <ul style="list-style-type: none"> use risers 31. Lower the worker <ul style="list-style-type: none"> provide a stool to sit on 	✓		low	med	med
			✓		low	med	med
			✓		low	med	med
16. Lifting forces	<ul style="list-style-type: none"> Rarely occurs 	N/A					
17. Pushing or pulling	<ul style="list-style-type: none"> Rarely occurs 	N/A					
18. Whole body vibration	<ul style="list-style-type: none"> Rarely occurs 	N/A					
19. Fixed position, standing	<ul style="list-style-type: none"> Standing surface is hard 	86. Provide an appropriate anti-fatigue mat 96. Provide appropriate shoe inserts 52. Provide a footrail or footrest		✓	med	med	med
			✓		low	med	med
			✓		low	med	med

Back/Torso (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
20. Exposure to hard edges on legs, knees, and feet	<ul style="list-style-type: none"> Work station or work piece has hard or sharp edges 	9. Eliminate exposure to hard edges		✓	med	med	med
		<ul style="list-style-type: none"> lay a blanket or cushion over hard edges 	✓		low	med	med
21. Awkward leg postures	<ul style="list-style-type: none"> Work surface is too low 	124. Raise the work piece/ work surface	✓	✓	med	med	med
		31. Lower the worker <ul style="list-style-type: none"> provide a stool to sit on 	✓	✓	med	med	med
22. Standing foot pedal	<ul style="list-style-type: none"> Rarely occurs 	N/A					

Head/Eyes

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