

CASE STUDY - Melting (Small Parts)

TASK TITLE: Melting (Small Parts)

Task Description:	<p>Melting of small parts involves heating a substance (such as wax) and applying it to a part requiring many fine movements. This task may be performed from the seated or standing position. Hand tools with pencil size grips may be employed to perform the task. Task duration is dependent on the complexity or nature of the product.</p> <p>Typical jobs in which melting small parts is performed include (not necessarily limited to):</p> <ul style="list-style-type: none">• dental lab
Job Performance Measures Most Often Impacted by Melting (Small Parts):	Final quality of product (characteristics identified by lab).
Typical Employee Comments about Melting (Small Parts):	Employees typically complain about discomfort and/or stiffness in the hands/wrists/arms and shoulders/neck.
Suggested Level II Analysis:	Grip Force, Postural 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 is performed in a restricted space • Jig or fixture is not available • Work location is too high or too far away 	41. Move work piece closer to body <ul style="list-style-type: none"> • move supplies and tools within easy reach 	✓		low	med	med
		136. Rotate the work piece <ul style="list-style-type: none"> • provide fixture or jig with rotational capability 		✓	med	med	med
		83. Provide an adjustable height lift table		✓	high	med	med
		123. Raise the person <ul style="list-style-type: none"> • use a step stool • provide an adjustable platform 	✓	✓ ✓	low high	med med	med high
		41. Move work piece closer to body <ul style="list-style-type: none"> • move supplies and tools within easy reach 	✓		low	med	med
2. Arm forces: Repeated contraction of arm muscles or holding/carrying materials	<ul style="list-style-type: none"> • Rarely occurs 	N/A					
3. High speed, sudden shoulder	<ul style="list-style-type: none"> • Rarely occurs 	N/A					

movements							
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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"> Lighting is not appropriate for the detail required Object is located flat on the work surface 	22. Increase light levels <ul style="list-style-type: none"> provide a task light which is easy to adjust increase room lighting provide a task light with a magnifying glass 136. Rotate the work piece <ul style="list-style-type: none"> provide a fixture or jig with rotational capability 		✓	med	med	med
				✓	high	high	high
				✓	med	high	high
				✓	med	med	med

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"> Work objects are located too far away 	41. Move work piece closer to body <ul style="list-style-type: none"> move supplies and tools within easy reach 	✓		low	med	med
		136. Rotate the work piece <ul style="list-style-type: none"> provide fixture with rotational capability 		✓	med	med	med
6. Repeated manipulations with fingers	<ul style="list-style-type: none"> Rarely occurs 	N/A					
7. Hyper-extension of finger/thumb or repeated single finger activation	<ul style="list-style-type: none"> Rarely occurs 	N/A					
8. Hand/grip forces	<ul style="list-style-type: none"> Work piece must be hand held 	136. Rotate the work piece <ul style="list-style-type: none"> provide a fixture or jig with rotational capability 		✓	med	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
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"> Work station has sharp or hard edges 	9. Eliminate exposure to hard edges	<ul style="list-style-type: none"> ✓ ✓ 		<ul style="list-style-type: none"> low low 	<ul style="list-style-type: none"> med med 	<ul style="list-style-type: none"> med med
		<ul style="list-style-type: none"> • provide padding for edges • round off exposed edges 					
	<ul style="list-style-type: none"> Tool handle has hard edges 	112. Provide support for the arms			<ul style="list-style-type: none"> med 	<ul style="list-style-type: none"> med 	<ul style="list-style-type: none"> med
		<ul style="list-style-type: none"> • add padded arm rest extensions to table top 					
		9. Eliminate exposure to hard edges					
		<ul style="list-style-type: none"> • provide a tool with a round, smooth handle with no ridges or edges • provide a handle of at least 5" (12.7cm) in length • wrap handle with fabric tape 	<ul style="list-style-type: none"> ✓ 		<ul style="list-style-type: none"> med med low 	<ul style="list-style-type: none"> med 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
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 too low • Lighting is not appropriate for the detail required • Movement around work area is restricted 	124. Raise the work piece/work surface <ul style="list-style-type: none"> • raise the table onto blocks 	✓		low	med	med
		22. Increase light levels <ul style="list-style-type: none"> • provide a task light which is easy to adjust • increase room lighting • provide a task light with a magnifying glass 		✓	med	med	med
		79. Provide a work surface which is adjustable in height		✓	high med	high high	high high
		81. Provide adequate toe clearance <ul style="list-style-type: none"> • provide toe spaces at standing work stations 		✓	med	med	med
13. Twisting of the lower back	<ul style="list-style-type: none"> • Work objects are located too far away 	41. Move work piece closer to body <ul style="list-style-type: none"> • move supplies and tools within easy reach 	✓		low	med	med
		136. Rotate the work piece <ul style="list-style-type: none"> • provide fixture 		✓	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
14. High speed, sudden movements	<ul style="list-style-type: none"> Rarely occurs 	N/A					
15. Static, awkward back postures	<ul style="list-style-type: none"> Chair is inappropriate for task 	115. Provide support for the lower back <ul style="list-style-type: none"> adjust the chair's backrest forward provide a chair which has an adjustable floating backrest 	✓	✓	low med	med med	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					

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"> Standing surface is hard 	86. Provide an appropriate anti-fatigue mat		✓	med	med	med
		96. Provide appropriate shoe inserts	✓		low	low	low
		52. Provide a footrail or footrest	✓	✓	med	low	low
20. Exposure to hard edges on legs, knees, and feet	<ul style="list-style-type: none"> Work station has hard or sharp edges Work surface does not have toe spaces 	9. Eliminate exposure to hard edges <ul style="list-style-type: none"> provide padding for edges round off exposed edges 	✓ ✓		low low	med med	med med
		81. Provide adequate toe clearance <ul style="list-style-type: none"> provide toe spaces at standing work stations. 		✓	med	med	med
21. Awkward leg postures	<ul style="list-style-type: none"> Chair is too high/dangling feet 	52. Provide a footrail or footrest	✓	✓	med	low	low
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"> Glare directly from a light source: looking towards an overhead light Glare from an overhead light reflected off equipment or worksurface. 	109. Provide protection from glare from overhead lights/task lights <ul style="list-style-type: none"> position work between overhead lights. remove glossy or shiny surfaces from work area place the work station so that it faces a wall or partition. install parabolic louvers to direct light down on the surface. 	✓		low	med	med
			✓		low	med	med
			✓	✓	med	med	med
				✓	high	med	med
	<ul style="list-style-type: none"> Glare directly from a light source: looking towards an uncovered window Glare from an uncovered window reflected off equipment or worksurface. 	108. Provide protection from glare from natural light <ul style="list-style-type: none"> orient work station so that the person faces perpendicular to the window. adjust window coverings provide window coverings 	✓		low	med	med
			✓	✓	low med to high	med med	med med
	<ul style="list-style-type: none"> Glare directly from a light source: looking towards a task light Glare from a task light reflected off equipment or worksurface. 	109. Provide protection from glare from overhead lights/task lights <ul style="list-style-type: none"> adjust the task light to reduce glare. turn off the task light. shield task light to prevent it from shining into eyes. 	✓		low	med	med
			✓	✓	low low to med	med med	med med

Head/Eyes (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"> Light levels too high. Light levels too low: Uncorrected visual disorders cause the person to lean forward to see work Text too small to read. Text is difficult to read (poor quality) 	27. Lower the light levels <ul style="list-style-type: none"> remove pairs of fluorescent light bulbs from overhead fixtures. Note: this should be done with the appropriate technical assistance and the agreement of co-workers in the area. 22. Increase light levels <ul style="list-style-type: none"> provide task light increase overall light levels to meet the needs of tasks 14. Encourage person to have visual disorders corrected 18. Improve visual access to work <ul style="list-style-type: none"> increase size of text increase the legibility of text 		✓ ✓	low to med med med low med med	med med med med med med	med med med med med med
24. Intensive visual tasks, staring at work objects for long periods	<ul style="list-style-type: none"> Length of work task without a change of position for the eyes. 	8. Distribute intensive activities throughout the process <ul style="list-style-type: none"> perform intensive visual tasks for short periods throughout the day (as opposed to in one continuous session). 	✓		low	med	med

Head/Eyes (cont'd)

Job Factor	Potential Causes	Corrective Action	Level of Changes		Cost	Impact On	
			✓ Minor Modification	✓ Major Change		Quality	Productivity
		20. Incorporate rest pauses <ul style="list-style-type: none"> periodically look away from screen. 	✓		low	med	med